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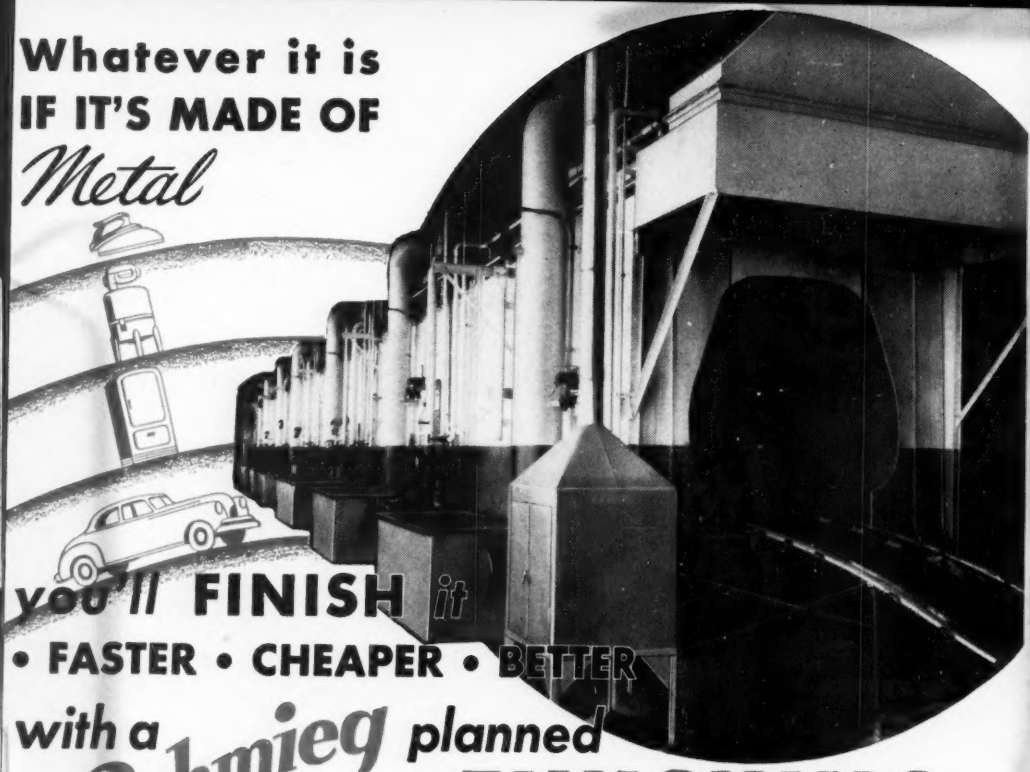

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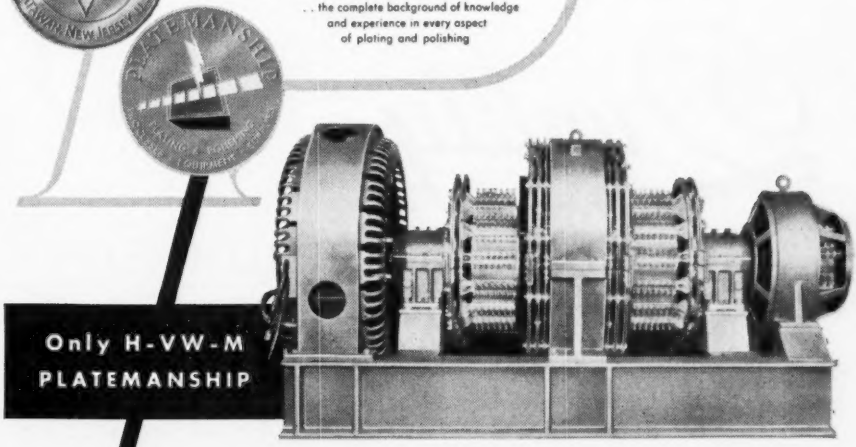

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Products finishing

APRIL 1951
VOLUME 15 • NUMBER 7

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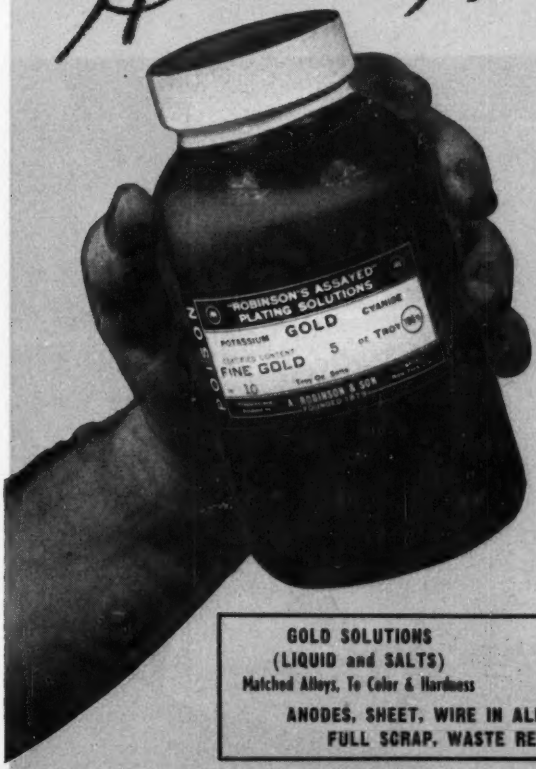

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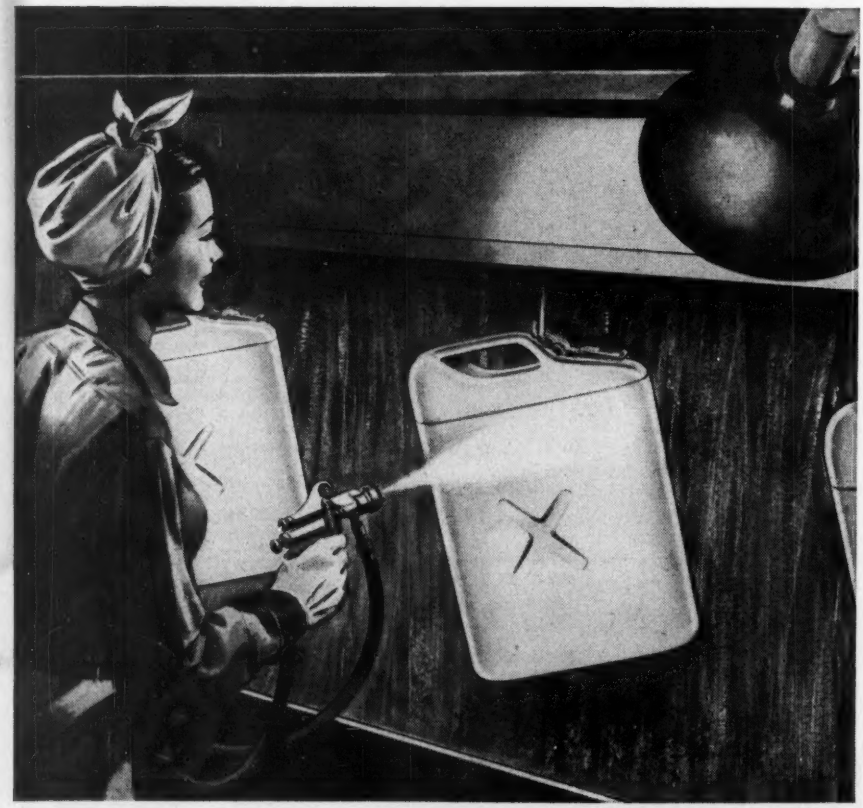

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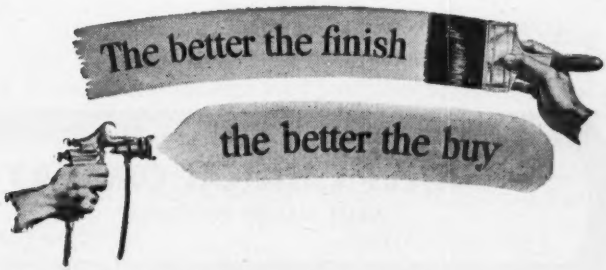

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pf editorial

Vol. 15, No. 7

APRIL, 1951

Another Critical Shortage---Trained Engineers

Engineering talent—perhaps the most critical and strategic commodity of all—is being neglected by the current government stockpiling program. Engineers are vital to the finishing industry, and particularly so in these hectic days of rapid plant conversion, and evaluation and selection of alternate finishes for many products. The remarks of S. M. Martin before the Dayton Branch, A.E.S., Annual Meeting, reported in part on Page 102 of this issue, serve to add emphasis to the vital part played by finishing engineers. Also, it is significant that the opening day of the A.E.S. 1951 Convention will include a discussion of "Some Engineering Aspects of Plating Room Operation."

Engineering problems in the paint finishing industry are of equal complexity and importance. Many of the considerations influencing finishing department design and finish specification were described in the article, "Finishing Floor Registers and Grilles at The Auer Register Company," published in the March 1951 issue of PRODUCTS FINISHING.

S. C. Hollister, Dean of Cornell's Engineering College, writing in the March issue of "Factory Management and Maintenance," points out that our country's chances of survival are dependent upon our ability to out-design, out-develop, out-produce, and out-perform our enemies. In these efforts engineers are clearly indispensable.

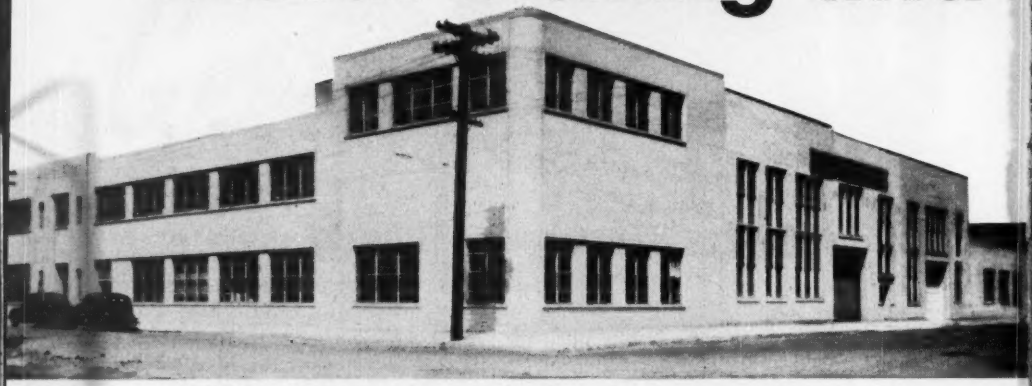
Much of the reason for the present shortage of engineers—a shortage to become more acute as more engineers and engineering students are drafted—can be laid at the door of management's traditional attitude that the engineer's position in the industrial organization is much less important (and therefore of less value) than that of salesmen or executives. While it is of no purpose to bemoan this error, it is not too late for management to alter its opinion and take corrective action.

However, it will take more than an altered management attitude to supply the need for trained engineers. Until that need can be supplied in the conventional manner, management will have to encourage key employes to take night school courses to improve their knowledge. On-the-job training and up-grading of the more capable persons will have to be carried on at an accelerated pace. Finally, since even these programs will not provide enough qualified individuals, senior engineers and management executives will just have to work harder to fill the gap.

Ezra A. Blount

EDITOR

Metal Etching and



By R. E. PETTIT
Vice President
Chicago Thrift-Etching Corporation

PF FEATURE

The Chicago Thrift Company was founded 25 years ago to manufacture coin banks, and the now nationally known "Money Barrel," to be used by commercial banks and savings institutions for presentation to customers opening new accounts. These coin banks and money barrels were polished, buffed, nickel and chromium plated, and carried identification plates bearing the name of the financial house in question, thus adding eye appeal to the product. The desirability of manufacturing identification plates, scales, rules, and dials, as well as the banks, soon became obvious, and so the operations of the company were expanded to include the new and wide field of metal etching with all of the accessory and allied operations used in connection with this process.

In April 1944 Dodge Manufacturing Corporation, Mishawaka, Indiana, acquired the Etching Company of America, originally founded in 1909. In August 1950 Dodge also acquired the Chicago Thrift Company, and in January 1951 merged the two enterprises, consolidating their operations in the plant of the Chicago Thrift Company, a view of which is shown in the article heading. The merged organization is known as the Chicago Thrift-Etching Corporation, and operates as a subsidiary of Dodge Mfg. Corporation.

It is a generally accepted fact that a good product deserves an attractive identification plate. The increased sales appeal generated by a striking and effective identification plate also aids product sales. Therefore, since the identification plate is a factor in the sale of the product in question, sales managers, as well as sales promotion and advertising managers, should select identification plates for their products, rather than delegate that authority to purchasing agents.

The development of new and improved alloys of aluminum, the introduction of stainless steel and magnesium challenges the skill of name plate makers. With new equipment and improved methods of processing and

Anodizing in Color

Metal etchings, identification plates, scales, rules, instrument dials and premium items, metal and plastic coin savings banks, and aluminum finishing by the Alumilite process (clear and in color) constitute the products and activities of the Chicago Thrift-Etching Corporation, Chicago 22, Illinois. Housed in a modern two-story plant containing 60,000 square feet of floor space, the company is equipped to perform quality manufacturing and finishing of identification plates and a wide variety of other products.

handling, the Chicago Thrift-Etching Corporation is able to take advantage of the improved metals available and to contribute in a modest way to the development of improved technique in the art of metal etching.

To be able to furnish customers with high-quality aluminum identification plates, the company operates a plant, under license from the Aluminum Company of America, for the Alumilite processing of aluminum and its alloys. The Chicago Thrift Company was one of the early pioneers in the commercial development of this process. The Alumilite finish, essentially aluminum oxide, is highly decorative and quite durable, resisting normal abrasive action and atmospheric corrosion. Designs in two or more colors may be produced, and being an integral part of the base metal, are not subject to chipping, peeling, or removal by normal wear and tear. The Chicago Thrift Company was the originator of the Alumilite processed aluminum identification plate. Figure 1 shows some of the company's products, clearly indicating the wide variety of design and finish effects obtainable.

Making Name Plate "Masters"

The art of identification plate making and the manufacture of scales and dials are exacting and require careful attention to every detail. Artists, pho-

Fig. 1—Some conception of the wide variety of name plates manufactured by the Chicago Thrift-Etching Corporation may be gained from the examples shown on these panels.

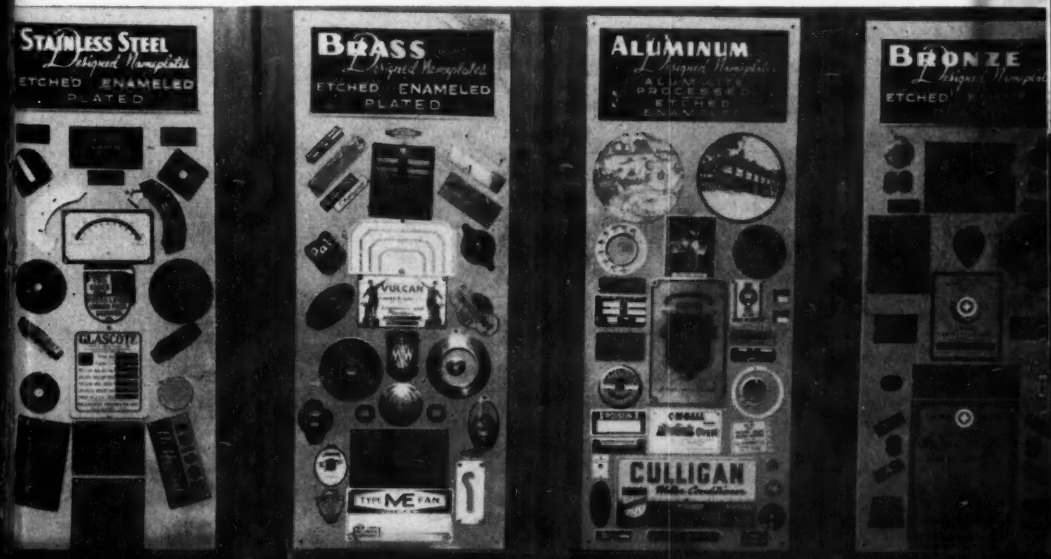


Fig. 2—A view taken in the art department.

tographers, plate makers, printers, etchers, enamelers, platers, die makers, punch press operators, stampers, inspectors, and shippers must have tools, machines, quality apparatus and working conditions in keeping with the results expected from each operation.

The first operation in the process is performed in the art department (Fig. 2), where drawings are made to customers' specifications, type is set or hand lettering is done, layouts are prepared, and so on. The plate-to-be is then reduced to the proper size by photographing on a glass negative, after which the negative is checked and retouched if necessary.

The image on the negative is next transferred (see Fig. 3) to a chemically treated zinc plate, which becomes the "master plate" from which impressions resulting in metal etchings will be made. This is one of the "key" operations in the process, and one that determines the quality of the final product. The zinc "masters" are kept in a special storage vault until they are to be put into production. Then they are delivered to the printing department simultaneously with the prepared metal sheets, which are to be printed and etched to form the identification plates.

Preparation of Name Plate Stock

Sheet metal, such as brass, bronze, aluminum, zinc, nickel silver or stainless steel, from which identification plates are to be formed, is first routed through the stock department where it is sheared to size. The size selected depends upon the predetermined processing cycle.

Sheared sheet stock is routed to the polishing and buffing department, where the various metals receive a finish in accordance with specifications. A

Fig. 3—A view of the transfer department. The photographic department may be reached through the door seen in the right rear of this photo.

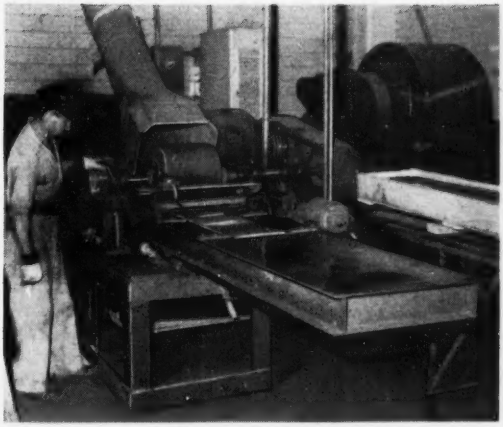


Fig. 4—Name plate sheet stock is buffed semi-automatically in this buffing machine. The sheets feed under the buff at the rate of 4 ft./min.

satin finish is produced on stainless steel sheets on a 36-inch diameter, 36-inch wide, drum-type machine with a felt base drum. (Pumice and oil are employed to produce the finish.) The machine may be noted in the right background of Fig. 4. The large metal sheets mentioned above may be given a buffed finish on the semi-automatic buffing machine shown in Fig. 4. This machine employs 16-inch loose buffs and spacers to make up the buffing wheel, which is somewhat over 12 inches in width. The buffing wheel has a speed of 2500 r.p.m. and a 2-inch oscillation. The sheet feeds through the machine at the rate of 4 ft./min. As can be noted in Fig. 4, a mechanical feed compound applicator is mounted so that it can be pushed across the buff face when necessary.

Sheet polishing is also accomplished on the Curtis Straight-O-Matic polishing machine shown in Fig. 5. On this machine 3M 12-inch abrasive belts, in 180, 240, or 320 emery, are used either with or without lubrication. Polishing of aluminum, brass, or stainless steel may be accomplished at the rate of 20 to 60 ft./min. at a polishing belt speed of 5,000 to 6,000 surface feet per minute. The Curtis machine may be adjusted to a maximum opening of 4 inches so that extruded sections may be polished.

For color buffing aluminum, a Canton flannel buff is used, and for certain stainless steel finishes, a sisalin buff followed by a finish buffing operation is employed. Buffing techniques and buffing compounds employed for the vari-

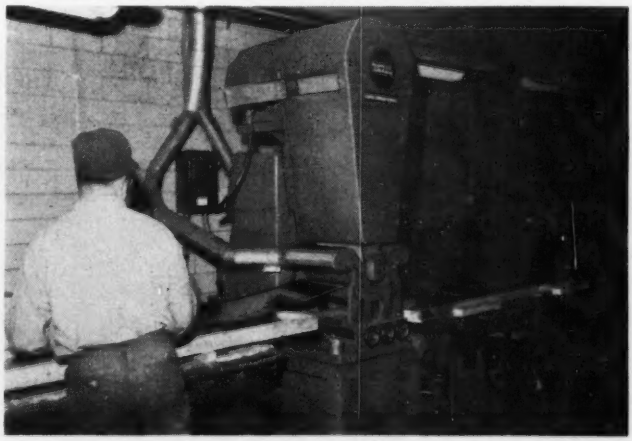


Fig. 5 — Brass sheets are shown being processed through the Curtis Straight-O-Matic sheet polishing machine.

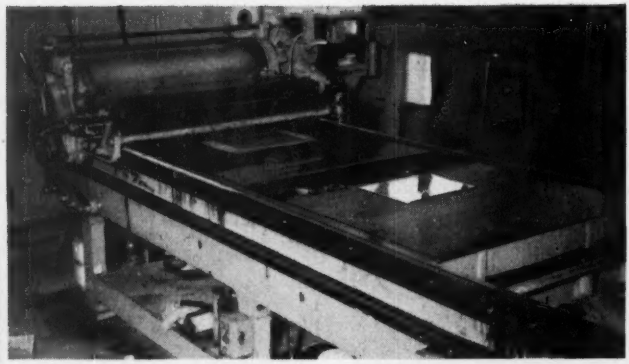


Fig. 6 — A view of a printing machine with the zinc "master" and a sheet of name plate stock mounted in position for printing.

ous metals conform with standard practice.

Following the polishing and buffing operations, the sheet metal can be routed a number of different ways depending upon the subsequent finishing cycle which is to be employed. Stainless steel, for example, may go directly to the printing room. Aluminum may be anodized and then printed, or it may be anodized, colored, and then printed, or printed direct. Brass may be sent directly to the printing room, or it may be chromium plated first. From the many different identification plates illustrated in Fig. 1, it can readily be understood that the routing varies with each type of plate and with the base metal employed.

Printing and Etching

When an identification plate is scheduled for production, the zinc "master" plate is sent to the printing room so that the identification plate sheet stock, previously buffed to the proper finish, can be imprinted with the desired design. Figures 6 and 7 show printing presses used for this operation; altogether there are five presses in this department. Metal to be printed is first cleaned by mopping with a benzine derivative, dried, and then placed on the press bed along with the zinc "master". Only the pattern on the sensitized zinc plate will take ink and transfer it to the rubber roller, or blanket. The rubber roller then transfers the ink pattern to the metal to be printed. Lithographed identification plates are printed with ink which will air dry, so that the identification plates can be coated directly with clear lacquer and baked. Identification plates to be etched are printed with a non-dry-

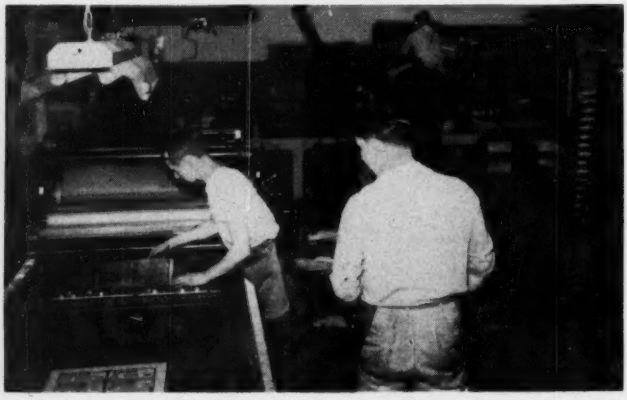


Fig. 7 — In operation in the foreground is a Deffa printing press. In the background may be seen a Hoe rotary flat bed offset press.

Fig. 9 — In these Binks spray booths, name plates are being painted to conform with customer specifications.

ing black printing ink, and, so coated, are transferred to the etching department for further treatment.

Printed plates are dusted with asphalt powder which clings to the design formed by the non-drying printing ink. Plates are next dusted with French chalk to remove the excess asphalt powder, and then cleaned of non-adherent particles with a jet of compressed air. Plates are then passed through an endless-belt gas-fired oven to fuse the asphalt powder and form a protective coating over the desired design so that it will not be attacked by the etching solutions. Backs of the metal sheets are painted with liquid asphaltum, which is allowed to air dry.

The stock, so prepared and protected, is placed in specially designed dipping baskets to be etched. The etchants used for this operation (which may be a plain dipping operation, or an electrolytic process), and the details of the exact process vary with the metal or alloy in question. Control of time, temperature, and acid concentration is essential to secure a predetermined depth of etch and keep the entire etched area uniform in appearance. Figure 8 is a view of the etching department. After etching, the plates are rinsed thoroughly in running water, hot water, and dried in sawdust.

Painting Processes

Etched plates, which are to receive one or more colors of enamel in the etched area, are routed to the enameling room. This department is equipped with a number of spray booths, in which various identification plates may be sprayed with any number of colored lacquers or enamels. Through the use of suitable paint masks, more than one color may be applied to an identification plate before the entire combination is air dried or baked. Figure 9 shows a spray operator coating a num-

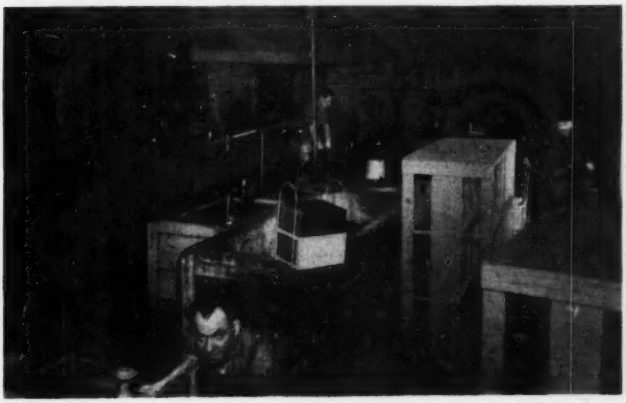


Fig. 8—Identification plates are racked in perforated acid-resisting frames for etching in the etching department.

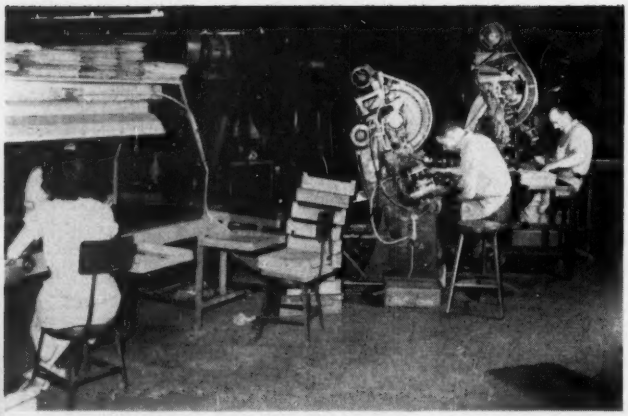


Fig. 10—A view of a small section of the press room showing the relative position of two rows of presses with respect to the conveyor belt which carries completed name plates through inspection to the packing benches. In all, 29 presses are in operation.

ber of identification plates which have been mounted on a specially designed spraying board over which a suitable paint mask has been placed. On some jobs, the color is wiped into the etched areas; others are silk screened, while others are printed.

Enameled plates are either permitted to air dry, or are baked in a gas-fired recirculating oven. The plates then pass to the cleaning room where the asphaltum stop-off material is removed. Apco thinner and resist solvent dissolves the backing material (which was not fired or fused into the plate), and the fused asphaltum on the face of the plates is removed from the raised surface with plastic, wood, or felt scrapers used in conjunction with the solvent. Some plates are scraped dry. In all cases operations are specified to secure optimum enamel or lacquer properties in the finished plate.

Stamping and Piercing

Since it is more efficient to process identification plates in quantity on a single sheet of metal, rather than handling each plate individually, the final operations in the process involve stamping and forming to produce the desired individual identification plate. At the Chicago Thrift-Etching Corporation these operations are conducted along four lines of punch presses, two lines conveniently arranged along the two sides of an endless belt conveyor. Thus, completed identification plates, some formed, some blanked out and pierced, feed directly from the presses onto the conveyor belt which carries them past an inspection station (shown at the left in Fig. 10) and on to the packing section where they are counted, wrapped, and prepared for shipment.

Close tolerances must be maintained on all plates, and corresponding close tolerances must be maintained on all dies used in the final operations, unless the previously performed work is to be wasted. To exercise close control over this phase of the plant operations, a well equipped tool and die department is maintained. In this department, a view of which is shown in Fig. 11, all tools and dies used in the plant are made and maintained in top operating condition.

Color Anodizing

Aluminum name plates, as well as other products, polished and buffed to a high luster, are anodized and then colored in black or any one of a number of colors in a well designed, efficient, conveyorized section of the plating and anodizing department, the floor plan of which is shown in Fig. 12. Parts to be processed through this unit are racked and loaded on a continuous

overhead chain conveyor which connects the racking and unracking tables with the Alumilite processing tanks and the line of tanks containing the various dyes used to color the Alumilite coating. Figures 13, 14, and 15 are views of these operations.

Racked parts, reaching the anodizing area, are processed as follows:

1. Alkali clean in Diversey 909 or 5 per cent caustic soda (for a matte finish).
2. Bright dip (optional).
3. Water rinse.
4. Anodize in sulfuric acid held between 74 and 78 deg. F. for 5 to 50 minutes, depending on the final color to be applied and service requirements.
5. Water Rinse.

5a. Aluminum castings are neutralized prior to dyeing.

6. Immerse in one of 15 stainless steel dye tanks for a predetermined length of time required to produce exact shade of color desired. The dye solutions are specially blended and, in operation, are controlled as to temperature between 140 and 160 deg. F., and also as to pH with a Leeds & Northrup pH Meter. Figure 13 is a view of the color anodizing unit showing how the transport conveyor passes over the cleaning and anodizing tanks and returns over the dye tanks shown on the left in the photograph.
7. Water rinse.
8. Seal 3 minutes in the special sealing solution in a stainless steel tank. The sealing solution is checked four times a day with the Leeds & Northrup pH Meter to ensure proper sealing of the Alumilite coating.

Racks of the colored and sealed parts are again hung on the overhead conveyor and are carried out of the unit through a 6-foot overhead infra-red oven, shown in the center background of Fig. 14, for drying. Descending to working level, the conveyor passes over the unracking (and racking) tables (shown in Fig. 15), where parts are removed for inspection and shipment, or further processing. For some parts a final color buffing operation with flannel buffs is specified.

Racks used for the anodizing process are made from 24S aluminum and used without rack insulation. After each cycle through the anodizing operation, the racks are stripped before being reloaded) to remove the anodic coating so that satisfactory electrical contact may be made with the parts subsequently placed on the racks.

When designs in color are specified for Alumilite processed aluminum iden-

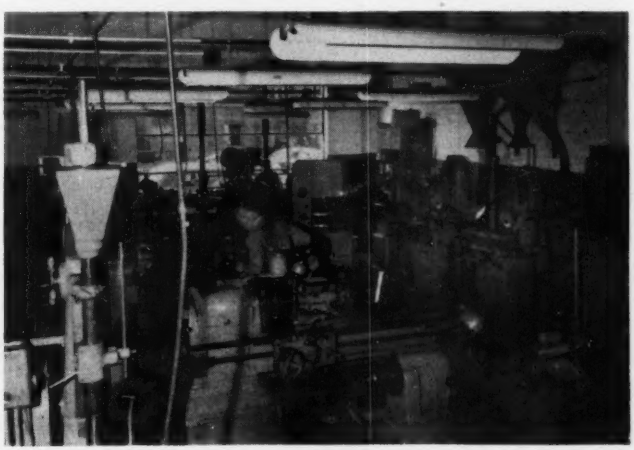


Fig. 11—Modern tool and die making machines, and painstaking care and attention to detail produce accurate tools, dies, jigs and fixtures in this machine shop.

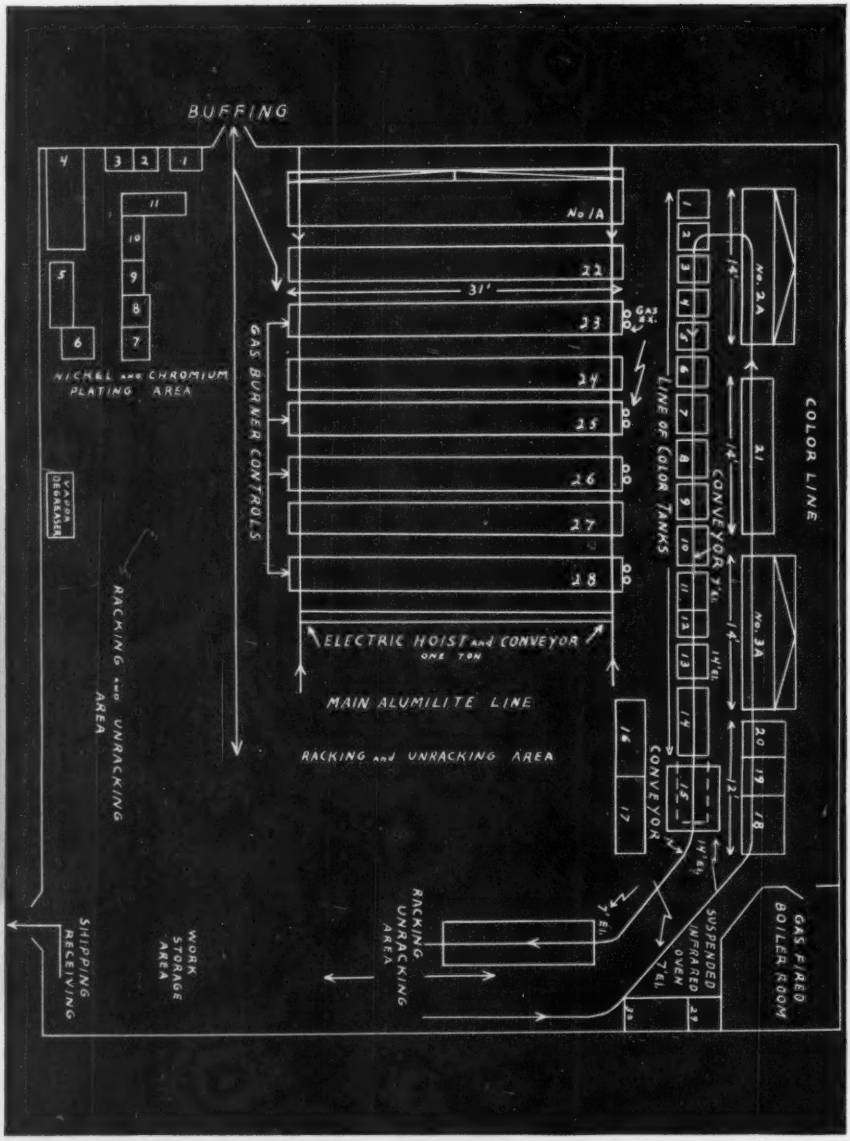


Fig. 12—Floor plan of the anodizing and plating department showing how space has been utilized for maximum efficiency of operation.
(Illustration courtesy Chicago Thrift-Etching Corporation, Chicago 22, Ill.)

tification plates, the plates must be printed, protected with stop-off, then anodized. This entire series of operations must be repeated for each color to be applied, since the color previously applied must be protected during subsequent processing cycles. Identification plates or other commercial products finished in several colors by this process will retain their colors indefinitely under normal conditions of exposure and service and will resist corrosion and abrasion for long periods of time.

Clear Anodizing Installation

As can be noted by reference to Fig. 12, the main Alumilite installation requires a majority of the space in the plating and anodizing department. This unit is used to form clear anodic coatings on a wide range of products (including identification plate stock), ranging in size from the small objects shown in Fig. 16 to long panels for bus exteriors, and architectural sections. The processing tanks are 31 feet long, 5 feet deep, and 4 feet wide. Racked parts are loaded on a long, 2-inch diameter copper bar, and transported from tank to tank by an overhead tramrail crane, as shown in Fig. 16.

Each Alumilite tank is provided with direct current by an 18-volt generator (one 5,000 ampere, and two 2,500 ampere capacity). The current used for each load is recorded automatically so that permanent records of each anodizing cycle are obtained. The temperature in each Alumilite tank is thermostatically controlled by a Brown

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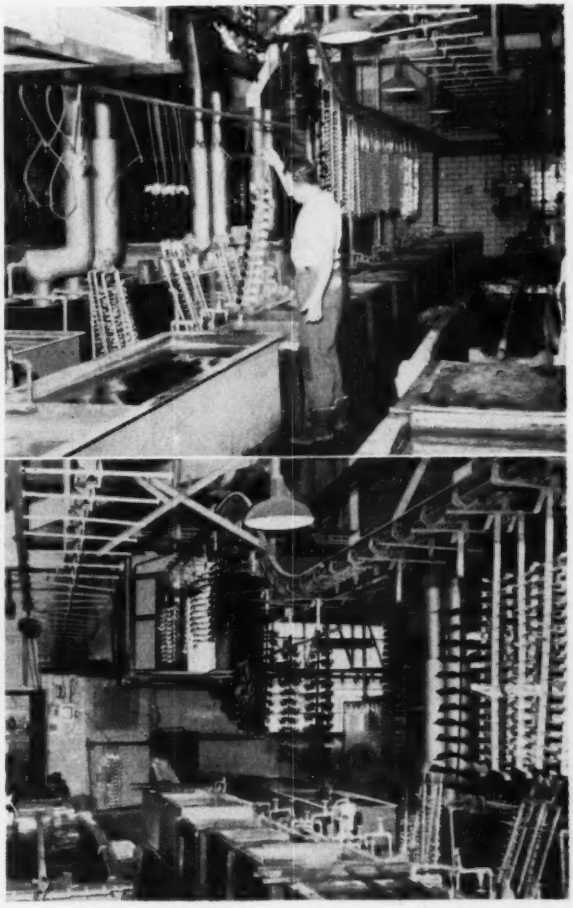

Fig. 13 (above)—A general view of the color anodizing section. Operator is shown rinsing a rack of anodized parts.

Fig. 14 (below)—Illustration shows racks of anodized and dyed parts being conveyed through a Fostoria infra-red oven (mounted overhead) where moisture is evaporated from the completed parts. Work dries in 3 minutes from the heat of 360 375-watt infra-red lamps.

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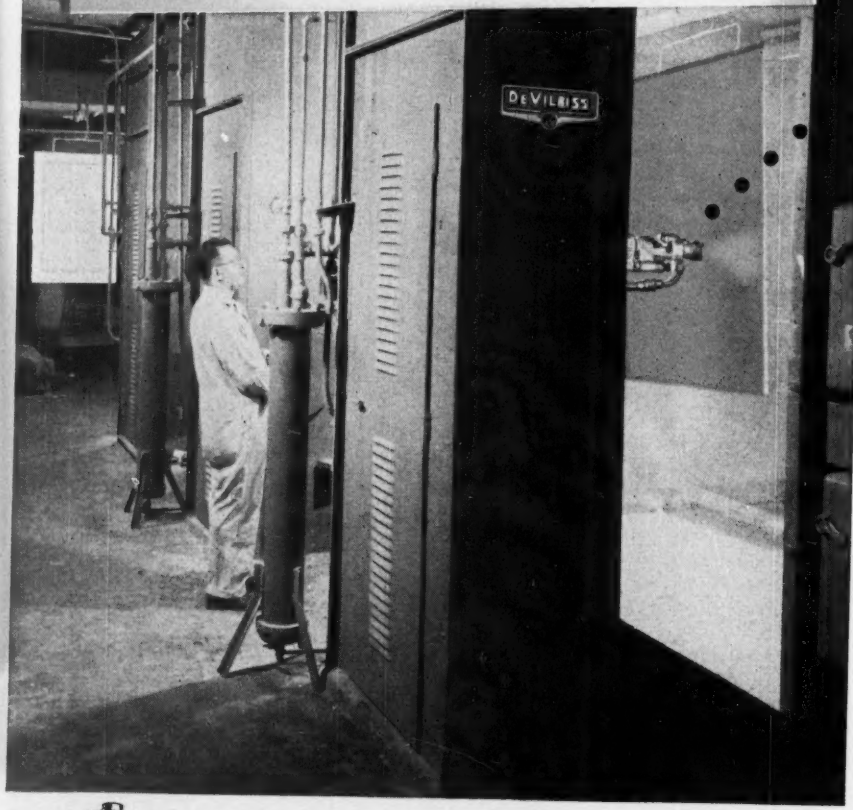

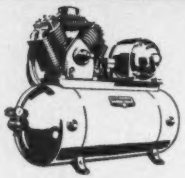

Air Compressors

Hose and Connections

Spray Guns

THE SPRAY THAT'S RIGHT ON THE BEAM

Plastic panels are coming through the fully automatic DeVilbiss spray finishing process you see in the photograph on left.

And the sales appeal these panels have at the retail level is due partly to the gleaming finish they get here.

This particular machine is one of 5 vertical transverse units built for spraying plastic panels on 48" centers and traveling 15 to 20 feet per minute.

Each transverse machine is equipped with 4 automatic DeVilbiss Spray Guns traveling at 288' per minute. They spray primer on backs; primer, and two color coats on fronts.

The neat part is that all the guns are controlled by light beam and operate only when there is work at the spray station. Improved finishing technique, like this, is typical of DeVilbiss service and products – Spray Equipment, Compressors, Spray Booths and Hose. To see how their application can be profitable to you, phone the nearest DeVilbiss branch office or write us direct for data.

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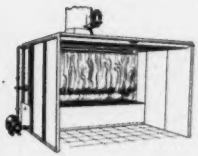

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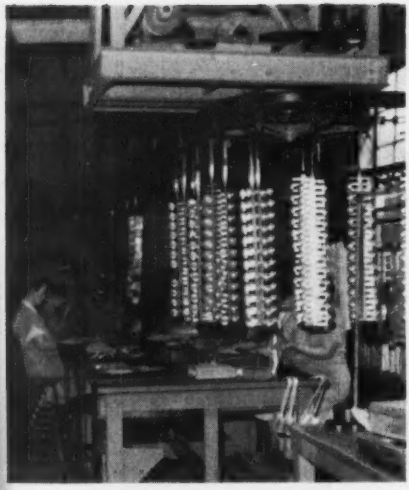

Fig. 15—Overhead conveyor, moving at 2 ft./min., carries racked parts between racking and unracking table, and color anodizing section.

Controller which regulates a refrigerating unit of 45 ton capacity. Figure 17 is a view of the generator and refrigerator room. Not shown in Fig 17 is a newly installed ice cell having an hourly capacity of 1,000,000 B.T.U. from which cold water is circulated by means of thermostatically controlled pumps to each Alumilite processing tank.

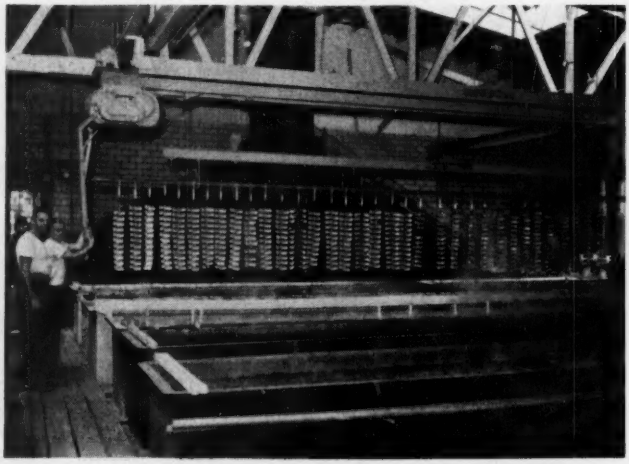

Fig. 16 — An overall view of the line of 31-foot tanks making up the clear anodizing installation. As can be noted, the department is well lighted, with adequate ceiling space. Loads are moved from tank to tank by the Chicago Tramrail crane shown in the illustration.

The large tanks in the installation which require heating are gas-fired with double burners, the immersion heating pipes running the full length of each tank. Ample exhaust facilities are installed to ensure healthful working conditions. To save heat during the winter months, a cross-draft of cold outside air is introduced opposite each exhaust duct so that most of the air removed from the room is cold air and a much smaller amount of room temperature air is removed.

The process used in the large anodizing installation is quite similar to that described for the color anodizing process and consists of the following steps:

1. Alkali clean (Diversey 909, 4-6 oz./gal.; Diversey Aluminux — for matte finish).
2. Cold water rinse.
3. Anodize for 30-60 minutes in sulfuric acid held at 68 to 72 deg. F.
4. Cold water rinse.
5. Seal in hot water (stainless steel tank) for 15 minutes at 208 deg. F., or in 10 per cent potassium dichromate (iron tank) for 20 minutes at 200 deg. F. The latter operation conforms with Army-Navy Specification AN-QQ-A 696A.

Certain long aluminum panels, used

as side panels for commercial vehicles or architectural installations, are anodized with a clear coating and then coated with a strippable plastic coating material, known as Liquid Envelope, which is allowed to remain on the panels until installed. The plastic coating serves as a protection against surface damage. After the panels are installed, the coating can be peeled off easily.

Products to be anodized are usually polished and buffed before treatment, the exact procedure being determined by the surface condition of the metal and the appearance specified for the final product. Identification plate stock is buffed, as previously described, on the sheet buffing machine or by hand on standard polishing and buffing equipment. Aluminum castings, tubing, and some sheet stock is polished on Behr-Manning or Minnesota Mining abrasive belts (150, 180, or 240 emery) mounted on polishing lathes fitted with idler backstands. The exact type of backing wheel used depends on the part being processed. A final buffing operation follows the polishing procedure, after which the parts are routed to the Alumilite processing department.

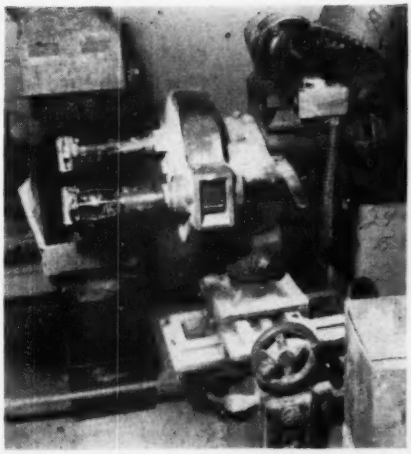

Fig. 18—A close-up view of the semi-automatic buffing setup used to buff brass money barrels. (*All photos by PRODUCTS FINISHING*)

Money Barrel Finishing

"Money Barrels" are currently being produced, made from brass or aluminum, in either a conventional round shape or an oval design.

The aluminum or the brass barrels are mounted in the semi-automatic fixture shown in Fig. 18, and buffed on a ventilated-type buffing wheel. The fixture holds two barrels (as can be noted in the illustration), each of which is rotated slowly by an auxiliary drive during the buffing operation. The alumi-

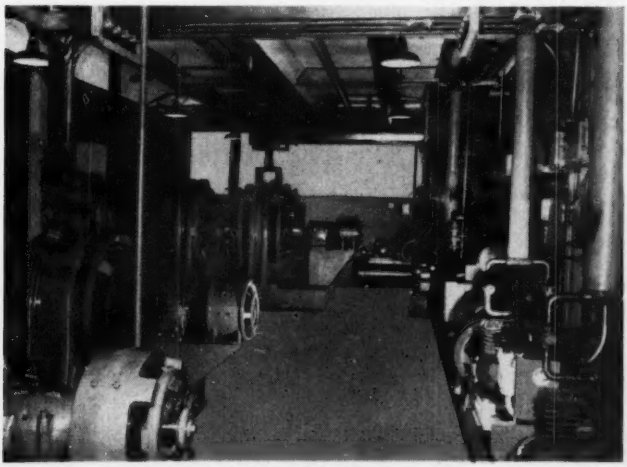

Fig. 17 — A view of the well - arranged generator and refrigerator room. Refrigerator units are so designed and installed that refrigerating loads may be shifted from one to another in case of emergency.

num barrels are then Alumilite processed in color; the brass barrels are nickel and chromium plated, and each decorated and fitted with identification plates carrying the name of the financial organization for whom they are being produced. The plastic house banks are semi-automatically painted using stencils and then fitted with the lock and the identification plate.

As can be noted from the foregoing discussion, the company maintains facilities for a wide variety of contract anodizing and plating, as well as identification plate, scale, rule and dial manufacture. In addition to the operations described, facilities are available for nickel, chromium, copper, brass, silver, and black nickel plating. Magnesium parts can be processed through the Dow No. 7 treatment, which consists essentially of a dip in hydrofluoric acid, a water rinse, and an immersion in 5 per cent potassium dichromate held at 160 to 170 deg. F. Treatment tanks are available also for the Alrok process (soda ash and sodium bichromate), used to produce a corrosion-resistant paint base coating on aluminum, as well as a protective oxide coating on aluminum parts containing non-aluminum inserts.

Complete, adequate equipment and long experience make possible the production of quality finishes on a variety of products. The Chicago Thrift-Etching Corporation considers it unsound practice for a manufacturer producing a good article or machine in any price range to label his product with a cheap identification plate, or to have an Alumilite finish applied to his product that will not do the job of protecting the surface of the part under the required service conditions. In many cases, the finish of an article is the silent salesman; it attracts the consumer, and a good finish of "eye appeal" sells the article. Therefore, it is a fundamental company policy that the elimination of one single operation, or the reduction of any processing time at the sacrifice of quality, is simply not tolerated. The staff of employees shares with the management the keen desire to make metal etchings and finish aluminum and its alloys so that no question as to the high quality of the finished product will ever arise.

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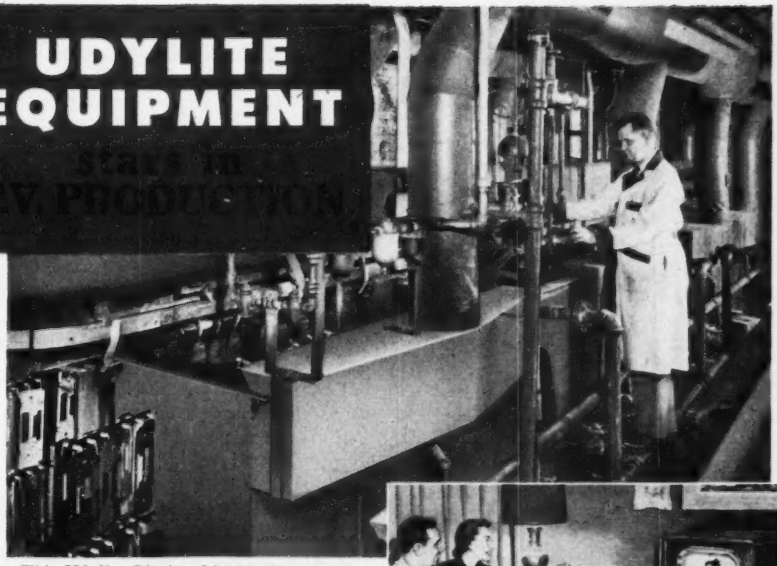
UDYLITE EQUIPMENT



This Udylite Plating Machine is used for applying finish to television receiver components at the plant of Motorola, Inc.

Motorola, Inc., one of the nation's leading manufacturers of television receivers, chose Udylite equipment to speed production and reduce plating costs. Motorola uses a Udylite Full Automatic Plating Machine to apply a protective finish to many small parts —vital to the efficient performance of a television set.

Motorola's engineers are quick to point out the economy and efficiency offered by Udylite equipment. Mr. Hank Mirrow, head of the plating department, says: "The Udylite Machine has been a great aid in processing and in conserving manpower in our plant. The machine has given us excellent service and has proved to be a necessity in our manufacturing operations."

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PIONEER OF A BETTER WAY IN PLATING

Formulation has a marked effect on the resistance of chlorinated rubber systems to corrosive solutions or atmospheres. For maximum chemical resistance the types of modifiers for chlorinated rubber are restricted to chemically inert resins and plasticizers which must be formulated properly to obtain optimum film properties and a satisfactory level of weathering resistance.

If proper precautions in selecting the modifying components are not considered, corrosion resistance of chlorinated rubber coatings may be seriously impaired. For example, alkali resistance rapidly diminishes by vehicle modification with saponifiable resins or plasticizers. Similar effects are evident if components are incorporated which are not in themselves unaffected by acids or salts.

Pigmented coatings in which the film consists of 50-60 per cent chlorinated rubber, 15-20 per cent Arochlor 5460, Chlorowax 70 or hard coumarone resins, and so on, and 25-30 per cent Clorafin 42-S, Arochlor 1254 or Cumar P-10, and so on, are shown to provide highly effective protection to corrosion. Panels with such coatings exposed in the salt fog (A.S.T.M. B-117-44T, 20 per cent sodium chloride, 100 deg. F.) and in tap water immersion (100 deg. F.) tests and compared with many other types of coatings, illustrate the specific value of such coatings when subjected to salt corrosion or water.

As best performance cannot be obtained without the use of suitable primers, a comparison of chlorinated rubber and other types of primers was undertaken in these tests. It is shown that pigmentation of chlorinated rubber primers is equally as important as that previously established with other vehicles. When properly formulated with corrosion-resistant pigments, chlorinated rubber primers together with chlorinated rubber topcoats afford a

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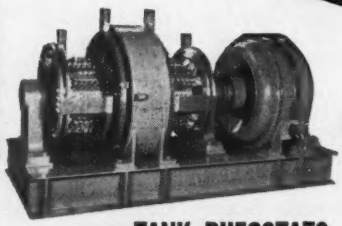

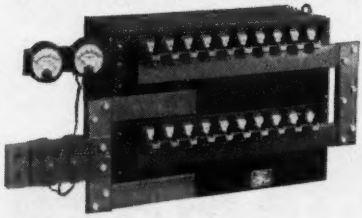

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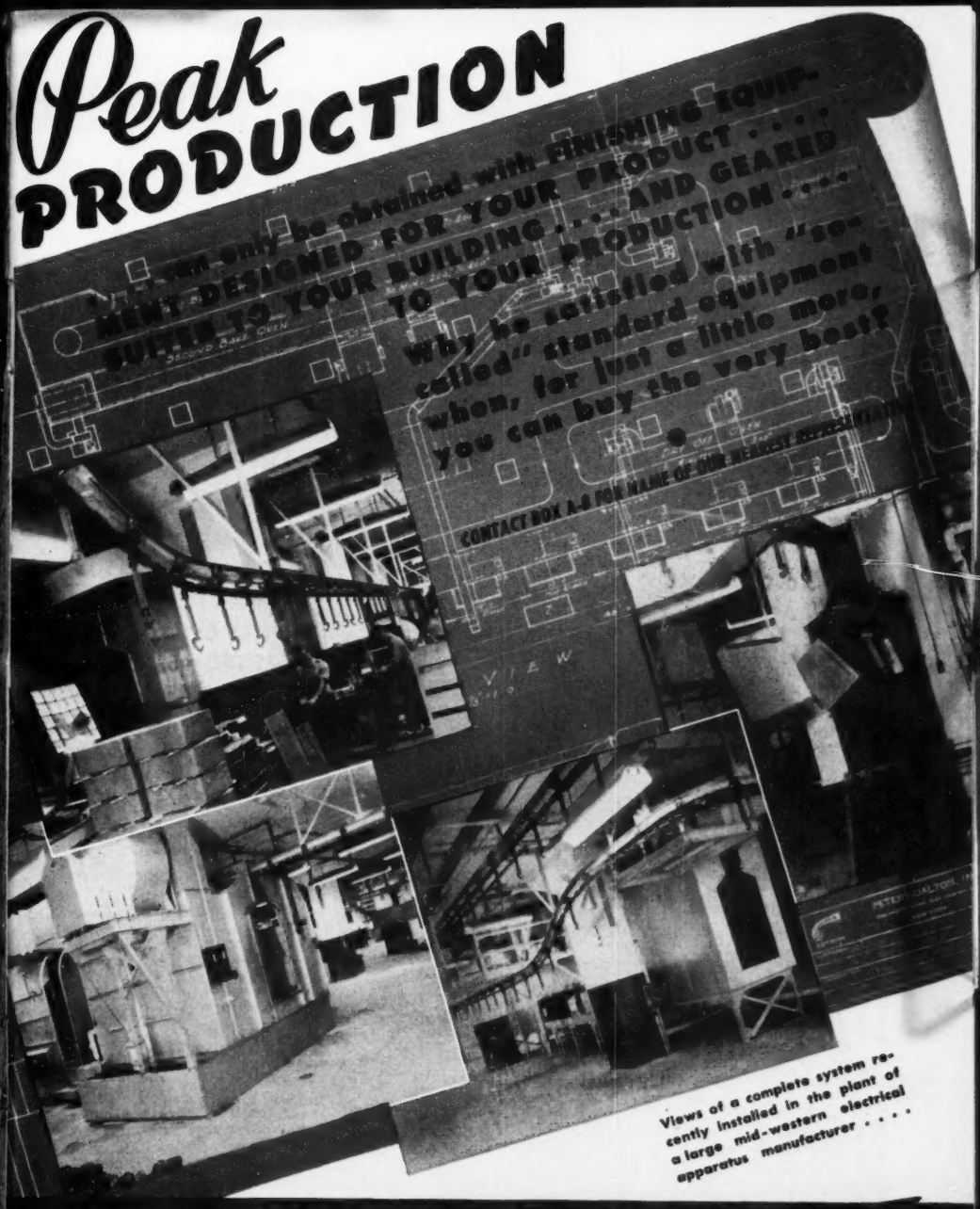

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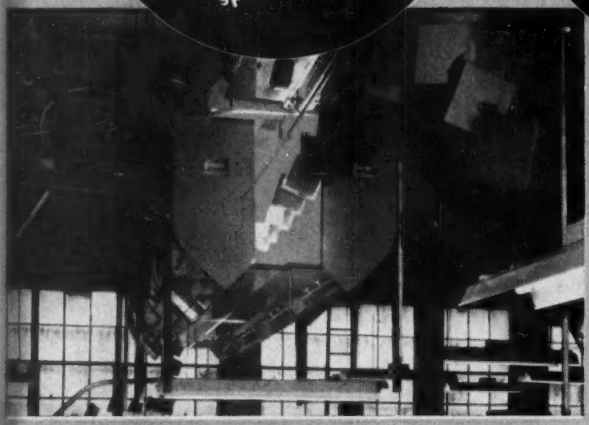

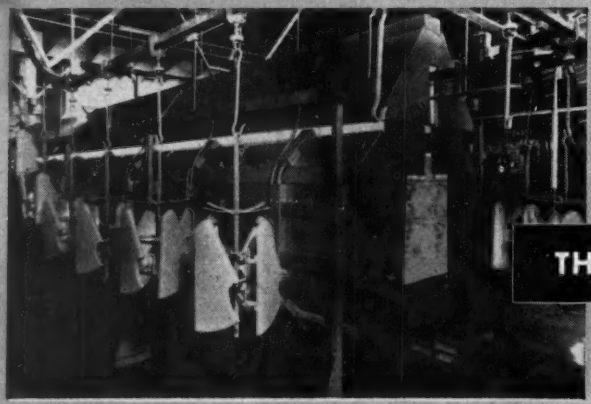

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France Mfg. Co., Cleveland, bakes the finish on transformer cases 3 times faster with Fostoria Infra-red than previously with forced air drying. Baking time is only 5 minutes, producing 8,000 cases in 8 hours. Space is saved by suspending the Fostoria oven from the ceiling.

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Before switching to Fostoria, Friden Calculating Machine Co., San Leandro, Calif., operated 3 convection ovens 20 hours per day, 5 days a week to obtain required finishing production. Now, a 44 ft. Fostoria Infra-red oven with a connected load of 90 KW turns out more production of better quality in only 7 hours per week — a savings of 93 hours. Weekly power bill is only $12.60 — a substantial cost savings compared to their previous convection oven operating cost.

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high degree of protection.

Numerous case histories of commercial usage in varied maintenance problems where chemical resistance is essential establish the economical merit of such coatings. Among the fields discussed are acid plants, paper mills, water works, industrial machinery, sewage disposal plants and various concrete construction protected by chlorinated rubber.

One particular feature of chlorinated rubber coatings has led to their acceptance for industrial maintenance. They are applicable by brushing or spraying to surfaces which cannot be physically prepared by ideal procedures. Chlorinated rubber, like most coatings, gives best results over rust-free, clean metal to which efficient primers are applied. The outstanding feature of chlorinated rubber, however, is that it affords reasonably good protection over many types of undercoats or over poorly prepared surfaces.

Digest of a paper presented as a part of The Protective Coatings Symposium, held during The 7th Annual Conference and Exhibition of The National Association of Corrosion Engineers, March 13-16, New York City.

Electrochemical Technique Aids Corrosion Studies

ELECTROCHEMISTS at one of the country's largest industrial research centers have established another beachhead in their battle against the harmful effects of corrosion. A new technique, designed to measure the effects of corrosive solutions, may substantially reduce the nation's annual corrosion costs, estimated at $5.5 billion, or about $37 per person.

Developed at Armour Research Foundation of Illinois Institute of Technology, under the sponsorship of the National Advisory Committee for

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G. L. Hehl, General Manager
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"To aid manufacturers in maintaining their finishing standards, Sherwin-Williams makes this statement of policy: "Restrictions in the supply of some of the quality ingredients of such well-known Sherwin-Williams industrial finishes as Kemvar, Kemclad and others may affect the *quantity* of such finishes that can be supplied.

"So long as these branded finishes can be supplied at all, however, no deviation in their *quality* will be permitted. "Users of such finishes can therefore be assured that if a label *says* KEMVAR, the material so labeled will *be* KEMVAR, as nearly unvarying in established performance characteristics, both on the production line and afterwards, as strict quality control can make it."

.. for DEFENSE production:

"The same integrity of product and appreciation of practical production problems is assured to users of Sherwin-Williams finishes for defense orders as for civilian requirements.

"Every effort will be made to furnish defense manufacturers with suggestions for making necessary change-overs to meet government finishing specifications accurately in spirit as well as letter, with least possible modifications of existing equipment."

Sherwin-Williams experience extending through two World Wars will be made available on any defense production problems, through facilities extending from coast to coast. Call, wire or write The Sherwin-Williams Co., 101 Prospect Ave., Cleveland 1, Ohio.

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INDUSTRIAL FINISHES

Aeronautics, the new method is similar to television scanning and can be used for detection, study, recording, and analysis of corrosion phenomena.

Dr. Howard T. Francis, supervisor of electrochemistry at the Foundation, explained that scientists can now measure corrosion as it takes place, regardless of the metal involved.

Corrosion, of which rust is an example, is caused by thousands of local cells similar to microscopic flashlight batteries. The electrochemical cells are formed by corrosive chemicals and the metal itself.

By studying the action of these tiny, unwanted electrical cells, electrochemists can learn more of the fundamental facts regarding corrosion.

"The laboratory sample on which corrosion occurs is a metal cylinder. This cylinder is dipped in some corrosive solution such as sea water, rotated several hundred times a minute, and scanned with a stationary probe electrode," Dr. Francis explained.

The probe electrode, which is a plastic arm containing 11 silver wires, is placed about 0.02 inch away from the submerged cylinder. It picks up the minute electrical currents caused by corrosion and enables scientists to measure and study the process. These tiny currents can be amplified and viewed on an oscilloscope screen or photographed for later analysis.

One advantage of this method is that it permits easier and faster study of the entire surface area of a corrosion sample. The new technique can be used for investigations of cathodic protection, corrosion inhibitors, stress corrosion, and in fundamental corrosion studies.

For further information on any product mentioned in this issue—use the READER SERVICE CARD between the covers.

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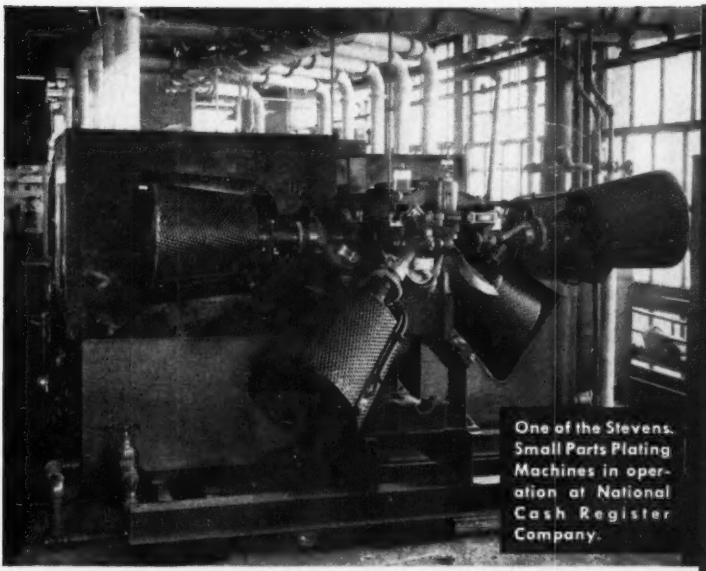

One of the Stevens Small Parts Plating Machines in operation at National Cash Register Company.

Stevens Small Parts Plating Machines

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The National Cash Register Company, Dayton, Ohio, has found Stevens Plating Machines a top-drawer investment for rapid, economical plating and handling of component parts. Here's proof of this: The first Stevens unit was installed in 1937. Since then—seven more Stevens machines have been purchased by the company. There are now five Stevens Automatic Small Parts Plating Machines and three Stevens Automatic Rack-Type Machines in operation at National Cash Register Co.

Your Stevens representative can show you examples of how materials handling and processing problems have been eliminated with Stevens equipment. Call him for a complete outline of what Stevens metal finishing equipment can—and will—do for your operations. Or write direct to *Frederic B. Stevens, Inc., Detroit 16, Mich.*

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Chemical Surface Treatment of KoolVent All-Weather

By NORMAN P. GENTIEU

RECENTLY, something new under the sun has been making architectural history across the country. Colorful aluminum awnings and doorway canopies, permanently installed and an integral part of homes or commercial buildings, provide air-conditioned shade in the summer and all-weather protection all twelve months of the year. And these awnings are rugged. Despite their constant exposure to the elements, they retain their original finish beauty.

Their durability makes them the ideal exterior decoration economically as well as aesthetically. They do not rot, corrode, flop, or tear. They never look shabby. They are not affected by heat, cold, dryness, or dampness. They eliminate the troublesome seasonal maintenance jobs of repairing, putting up, taking down, and storing of ordinary awnings. They are weatherproof, fireproof, and stormproof. In short, they are built for a lifetime of service with a minimum of attention (Figures 1 and 2).

These unique products are the KoolVent aluminum awnings manufactured by the KoolVent Metal Awning Corporation of Michigan. Their attractive design and their durable, lustrous beauty are the result of application of sound engineering principles and correct metal surface treatment practices. By utilizing recent developments in fabrication and finishing, this KoolVent plant is manufacturing aluminum awnings of uniform excellence in a series of operations characterized by simplicity, economy, and rapidity.

KoolVent Mechanical Design

KoolVent aluminum awnings are of aircraft type aluminum construction.

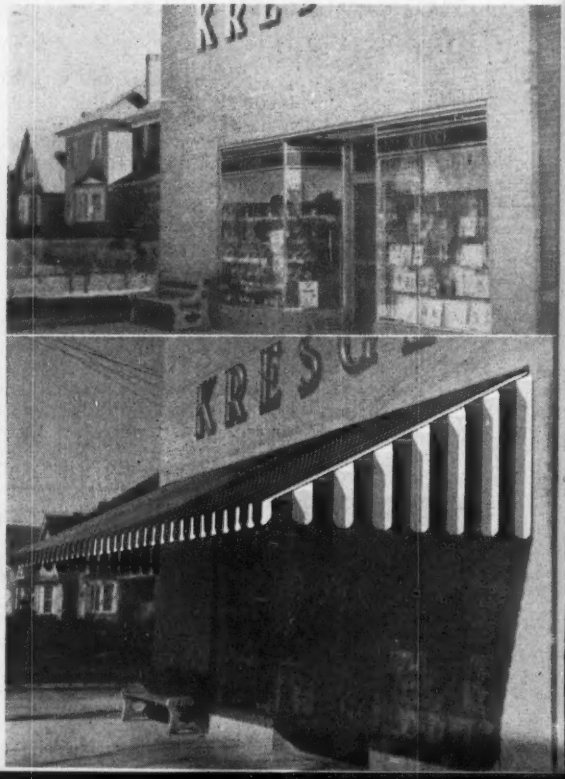


Fig. 1 — Commercial application for KoolVent aluminum awnings. This photograph shows the store before and after KoolVent installation.

Extends the Durability

Aluminum Awnings

They consist of a series of alternating separated layers of aluminum strips formed with their edges at right angles. Each alternating strip overlaps the strip immediately adjacent to it, so that space is provided between the overlaps for the free circulation of air and the admission of light.

The awnings embody several exclusive advantages found in no other design:

1. Air circulates through the series of patented vents and louvers and this movement of the ambient atmosphere dissipates solar heat, thus preventing the formation of heat pockets.
2. Overlapping construction screens out direct rays of the sun, but admits an abundance of soft, well-diffused, indirect light, soothing to the eyes.
3. Semi-closed construction, including covered sides, keeps out rain and snow.
4. Aluminum construction results in a sturdy product that is light in weight but structurally of great strength.

A recent cartoon in the national monthly house organ of the KoolVent Metal Awning Corporation of America (Fig. 3) emphasized structural strength by presenting a unique, if imaginative use of these durable air conditioners—more or less comfortable reclining chairs for urban sunbathers.

Long Life Finishes

Sturdy construction is but one of several factors contributing to the beauty and durability of KoolVent aluminum awnings. To insulate the metal from the weather, protect it from atmospheric contaminants, and dress each awning up to suit individual

Fig. 2—This KoolVent aluminum awning is an integral part of the residence which it enhances. It will remain in place all four seasons of the year, and preserve its attractive color and luster with little or no maintenance.

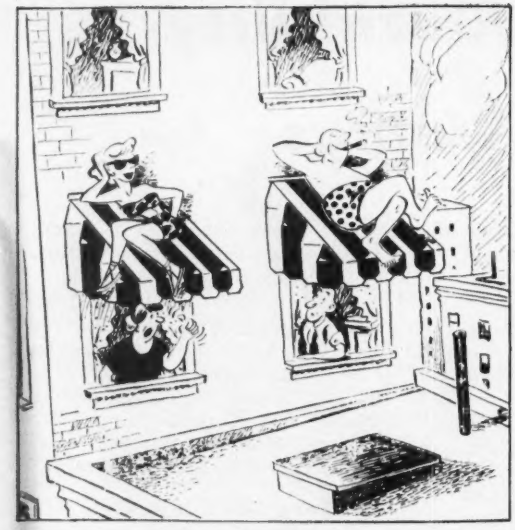


Fig. 3—One aspect of the durability of KoolVent aluminum awnings is illustrated in this cartoon, although this sun bathing procedure is not recommended to KoolVent owners.

tastes, the Detroit aluminum awning firm has carefully selected a paint finish system that meets exacting specifications.

Representative specimens of the KoolVent finishes have been tested in a weatherometer (Fig. 4), a "torture" machine which intensifies the wearing effects of ordinary weather, for a period roughly equivalent to five years of actual exposure. Even with continued onslaughts of moisture, temperature differences, and the destructive actinic ultra-violet rays of the sun, no appreciable change in color, adhesion, or flexibility has occurred. Other tests in Florida sunshine and Northern ice have been carried out with equally good results.

Such prolonged and severe chemical testing showed what sun, rain, snow and other weather conditions would do to the finished awnings, and enabled KoolVent to select paint finishes of the highest quality. Surprisingly, as a result of these tests, some enamels were found to be inadequate in adhesion, flexibility, color retention and other important properties. KoolVent selected The Cook Paint and Varnish Company, specialist in fine paint finishes for many years, to develop rugged enamels from non-fading pigments and durable liquids that would meet the unusually rigid requirements of a constantly exposed surface.

In these finishes beauty was not subordinated to durability, however. Their attractiveness, obvious in each shade but greatly enhanced by the use of tasteful color combinations, is apparent even in the names of the standard colors available. Chesterfield cream; Sherwood green; Pagoda red; Autumn brown; Hollywood yellow; Pennant blue; and Fiesta orange are the names of a few of these, selected at random.

An Anchor For The Finish

Aluminum, which possesses many structural and fabricating advantages, does not have the ability to bond paint well unless the metal surface has been converted to a non-metallic layer mechanically and chemically receptive to paint. Conventional methods for the conversion process oxidize the aluminum surface either chemically or anodically (an electrolytic process). Both chemical and electrolytic oxidation methods create on aluminum a tough durable paint-bond.

Recently, a new treatment utilizing the new protective coating chemical "Alodine"* has made available to industry a process that can be used for both small and large production. Alodizing forms an excellent protective

* *Trade Mark Reg. U. S. Pat. Off.*

coating on aluminum in an unusually short time, without the aid of an electric current. It does not require a subsequent "sealing" operation.

Alodine, discovered and developed in the Research Laboratories of the American Chemical Paint Company, changes the surface of the aluminum awning elements into a non-metallic, insulating, amorphous phosphate coating possessing excellent atomic or quasi-atomic paint-bonding properties.

The Alodine protective coating at the paint-metal interface anchors the decorative finish securely to the aluminum. And because it makes paint stick to the metal even after months of weathering and wind-dust abrasion, Alodine greatly enhances the protection inherent in all KoolVent finishes. Comparative tests involving both Alodized aluminum panels and acid-cleaned aluminum panels in salt spray, humidity, and water (total immersion soaking) proved conclusively to KoolVent that Alodine provided unusually high protection to both metal and paint finish. In these tests, all the acid-treated panels broke down and failed prematurely. On the basis of this comparison, Alodine was selected as the surface treating chemical certain to provide the high quality metal protection and paint adhesion required by the fine standards set up by KoolVent Metal Awning Corp. of Michigan.

Alodine possesses another property that is extremely important in any good chemical conversion coating: electrical insulation. This is simply the property which prevents undermining of the paint film at a scratch or other break in the paint film. It confines corrosion to the places where bare metal is exposed by accident.

Besides affording a tenacious paint bond and acting as a deterrent to under-paint corrosion, the Alodine coating enhances the aesthetic and decorative properties of the paint itself by accentuating the luster and imparting the appearance of extra "body" to the paint. In contrast, neither acid nor alkali cleaners add anything to the paint finish on aluminum.

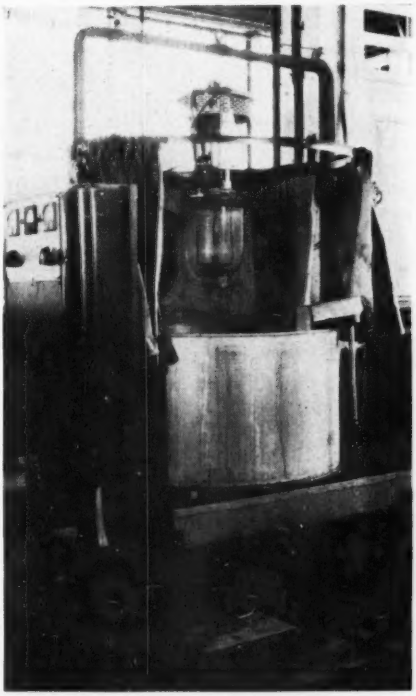


Fig. 4—Painted Alodized aluminum panels are subjected to an accelerated weathering test in this "torture" machine. The weatherometer simulates actual weathering conditions—sunshine, rain, and so on—and gives an indication as to the durability of painted aluminum products in actual service.

The Alodizing Process

In the compactly arranged KoolVent plant, the Alodizing installation consists of five relatively narrow tanks, each approximately 4 feet wide, 15 feet long, and 2 feet deep; and each with a capacity of 600 gallons. These are set up in parallel rows so that a minimum of floor space is occupied.

The stages and their sequence are as follows:

1. "Ridoline" No. 3192 alkali-solvent cleaner
2. Fresh water rinse
3. Alodizing with Alodine
4. Fresh water rinse
5. "Deoxylyte" - acidulated water rinse

The tank containing the Alodine solution is of stainless steel; all the other tanks are of mild steel. The tanks of Stages 1, 3, and 5 are heated to the required temperatures by electrical immersion strip heaters.

Aluminum parts to be cleaned and Alodized are placed in a large stainless steel wire basket (Fig. 5) which is just a little smaller than the inside of the processing tanks. This basket is lifted and lowered by an electrical power hoist and moved manually on an overhead trolley from tank to tank by a plant operator.

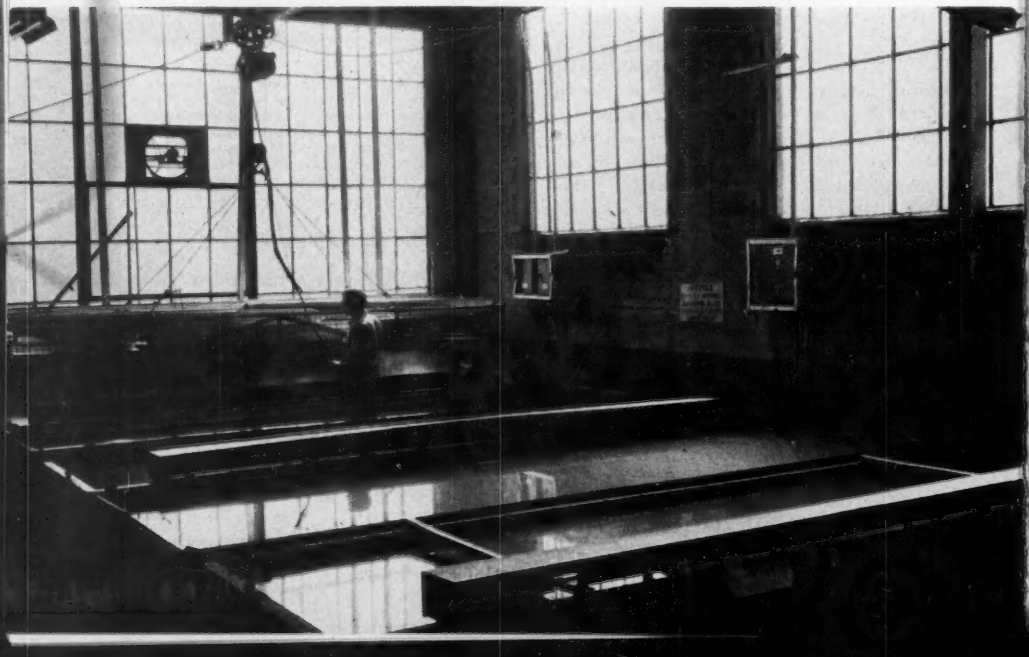
In the first stage, a well-buffered alkaline cleaner removes the layer of light forming oil and other surface soil such as dust. After this thorough cleaning, the work is rinsed in clean water and then immersed in the Alodine chemical bath.

This Alodine bath is maintained at a temperature of about 120 deg. F.—slightly above room temperature—and it reacts with the aluminum parts for a time of approximately 1½ to 2 minutes. In this extremely brief period, an excellent protective coating and paint bond of a pleasant greenish color is formed.

A fresh water rinse washes off excess Alodine chemical solution and finally a rinse, acidulated with "Deoxylyte", neutralizes alkaline residues possibly left on the work in the fresh water rinse stage, and establishes an optimum pH on the aluminum surface for good paint adhesion.

After air-drying, the Alodized aluminum parts are carried individually on an overhead chain conveyor to a double-decker paint spray booth where painters on two levels apply specified KoolVent finishes. Here the awning

Fig. 5—The Alodizing installation at the KoolVent Metal Awning Corporation of Michigan plant in Detroit. The operator is about to lower parts racked in a stainless steel basket into the cleaning tank prior to Alodizing.



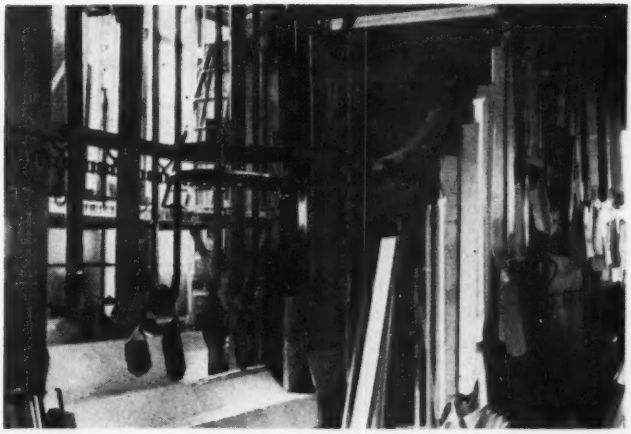


Fig. 6 — This photograph shows painted Alodized aluminum parts leaving the paint spray booth and moving towards the infra-red drying oven. Assembly takes place shortly after these parts leave the infra-red oven. (*Photos courtesy KoolVent Metal Awning Corporation of Michigan*)

units are durably finished with high gloss enamels and in a subsequent stage, baked in an infra-red oven (Fig. 6). The paint-receptive Alodine coating makes it possible to secure a lustrous and full-bodied finish with a minimum coating of paint. This, of course, contributes materially to economy in KoolVent production.

As one advertising piece says, "There's more to KoolVent than meets the eye." This applies especially to the Alodine protective coating and paint-bond which promotes permanence of both metal and finish. Invisible under KoolVent's lustrous paint but always present like a silent guardian against paint failure, the Alodine coating holds paint and metal together and is, itself, an integral but non-metallic part of the aluminum. KoolVent awnings made by KoolVent Metal Awning Corporation of Michigan are carefully and thoroughly prepared and finished to withstand all the rigors of summer and winter weather. For the consumer this means added years of effective and economical performance by an unusually attractive aluminum awning. For the manufacturer, it means the protection of a high quality product and also the preservation of a valued industrial reputation.

Nickel silver, a copper-base alloy containing nickel and zinc, is used as a base for silver plated flatware and hollow ware.

Usually thought of in connection with bathtubs, sinks and appliances, porcelain enameled steel is used in numerous industrial applications requiring extreme hardness or durability and resistance to heat, corrosion or abrasion. Among these uses are tank linings for acid and alkaline substances, conveyor buckets for abrasive materials, power piping finishes, and surfacing of coal, grain and package chutes.

During 1950, Alcoa made substantial improvements in procedures for electroplating aluminum parts and considerable progress in adapting this finishing process to production methods. A number of companies equipped themselves during the year to plate aluminum parts on a commercial basis. Applications included hard chrome on aluminum cast cylinders for small gasoline engines and decorative bright chrome on aluminum automobile hardware, such as bumper bars, bumper guards and door handles.

—*Light Metal Age*

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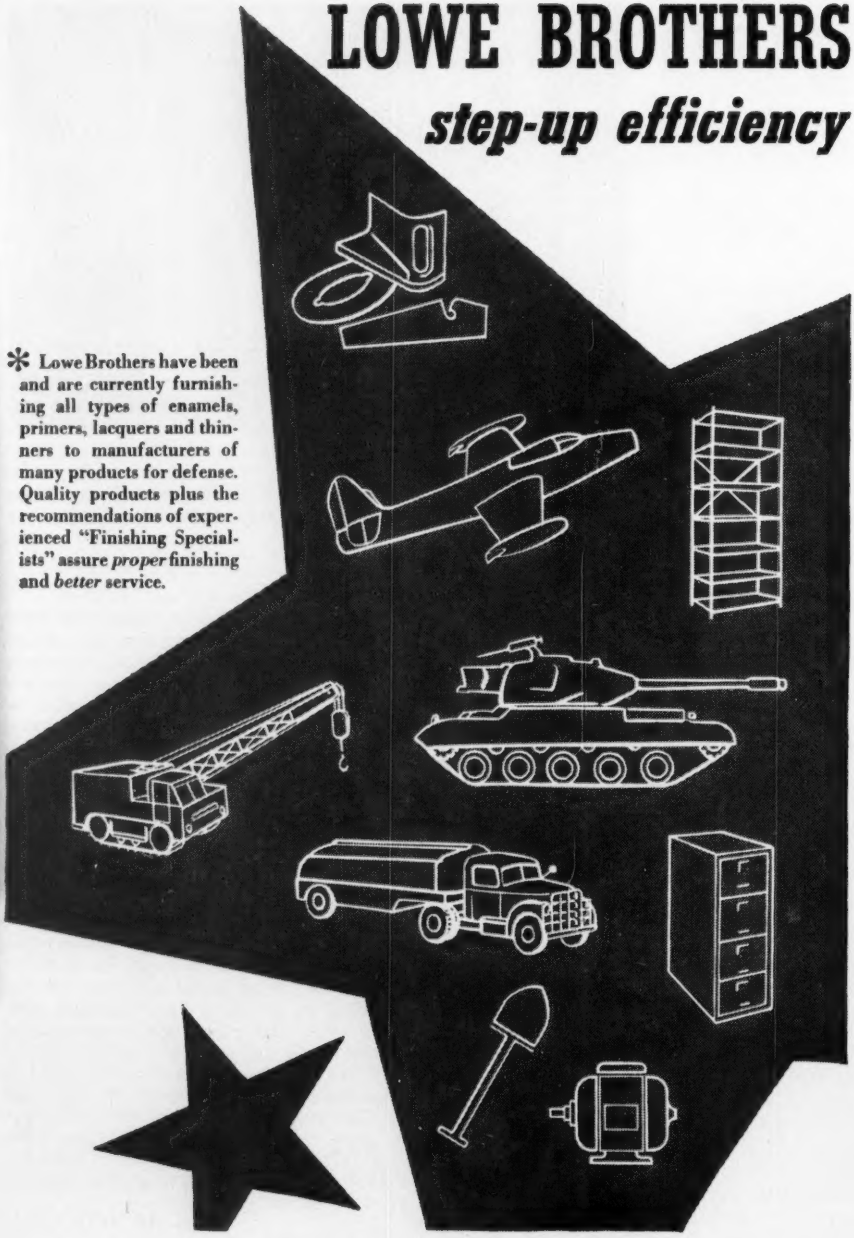

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Lowe Brothers "Finishing Specialists" have full knowledge of Government finishing specifications. This, plus their wide experience with *all types* of finishing systems and materials,* enables them to assist manufacturers in setting up efficient and economical production plans.

Whether or not you are in defense production, let a Lowe Brothers "Finishing Specialist" analyze *your* finishing methods. There is no obligation for this service, and it has led to new economies and better finishing results for many, many other manufacturers. Write today for full particulars.

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Evaluating the Characteristics of Glossy Finishes

THE fact that one of the primary purposes of many finishes is decoration makes the appearance characteristics of applied coatings extremely important. One of the most important appearance characteristics of finishes is gloss; in terms of finish evaluation, gloss is usually thought to mean luster, shininess, or reflecting ability of a coated surface or perhaps the ability to reflect light regularly. The production of a completely smooth, specularly reflecting surface has been one aim of the surface coating manufacturer for a long time. Gloss is closely tied in with surface appearance, since some of the characteristics of appearance are appreciated as gloss and some are appreciated as surface texture.

At the First Symposium on Varnish and Paint Chemistry, sponsored by New York University's College of Engineering, H. R. Luck and R. C. Archibald, Shell Development Company, Emeryville, California, described a method for photographing the details of glossy panels. The unique advantage cited for the technique is that the surface irregularities of an entire test panel may be revealed. The method makes it possible to put on the same photograph a comparison of the mirror-like characteristics of the test panel with an ideal smooth glossy panel. It was reported that such photographic records of surface irregularities have greatly facilitated

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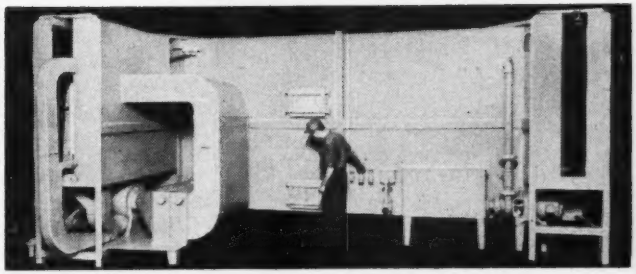

"WHAT is the best method of cleaning shells?" . . . "How can quenching oil be removed quickly?" . . . "How can we clean small gun parts?" . . . "What is the fastest way to clean disassembled motor parts?" These are just a few of the many urgent and pressing questions now being written, wired and telephoned to A-F Engineers.

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comparisons between coated surfaces.

There have also been recent developments in instruments for making reflectance and gloss measurements of coated surfaces. Reflectance and gloss

Fig. 1—Inspection of instrument cabinets for gloss using a 60-deg. gloss head and photometric device.
(Photo courtesy Henry A. Gardner Laboratory, Inc., Bethesda 14, Md.)

requirements are appearing in an ever increasing number of specifications. Figure 1 shows a 60 deg. gloss head and photometric unit, produced by the Gardner Laboratory, being used in the inspection of instrument cabinets for gloss. In research work, these new gloss instruments are being used for quantitative studies of appearance changes such as loss of gloss and change of reflectance, which accompanies weathering, wear from abrasion, fading from sunlight, and so on. In many cases it has been found worthwhile to place gloss measuring instruments in the factory as well as the laboratory to make measurements on many finished products.

Gloss Defined

The ASTM definition of gloss reads: "Gloss is the property of a surface by which it reflects light specularly. Glossiness of a surface is the appearance ascribable to its gloss". Luck and Archibald have compiled information to show that there are six types of gloss which are recognized and defined. Table I shows their compilation of these six types of gloss based on a combination of the ASTM and Hunter descriptions. The parts of the table that are underlined were those selected by Luck and Archibald as representing the most suitable definition or explanation of gloss with respect to photographing the details of glossy panels.

Harrison has stated that the answer to the question, "How does one know a surface is glossy?", can be had by examining three criteria. (See also—The Printing & Allied Trades Research Association—V. G. W. Harrison, "Definition & Measurement of Gloss", Dec. 1945). These criteria are described as distinct, but never occurring in isolation. First, there is the preferential reflection of light in certain definite directions. Second, there is the formation of mirror images. Third, there is the parallactic effect, in which one sees one surface through, or behind, another. For highly glossy surfaces, there seems to be little doubt that the formation of clear mirror images is of paramount importance. Also, as the gloss of a surface decreases, the mirror images rapidly become more and more confused, until, with specimens of medium gloss they can hardly be observed at all. At this point of the scale, therefore, the mirror image factor becomes of minor importance and its place is taken by the first factor, which is the preferential scattering of light in certain directions. Finally, at the near-mat end of the gloss scale, the first factor is the only one of importance, since there are no mirror images and the surface looks hard and well defined.

to page 52→

Weirton Chose Monel...

Scrubber tanks of Monel help keep maintenance costs low in Weirton Steel Company's new electrolytic tin-plating line

Capable of a continuous coating speed of 2500 feet per minute, the Weirton Steel Company's new No. 4 Electrolytic Tin-Plating Line is said to be the largest and fastest in industry.

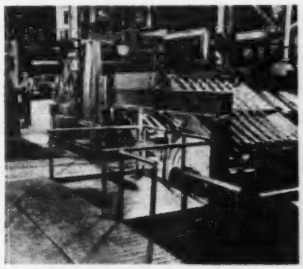
The rated capacity of the new line is 5,000,000 base boxes per year, raising the Weirton Tin Mill production potential to 15,000,000 base boxes annually.

Pickling tanks in the line are 100 feet long... oversize because of the high speed on the strip passing through. The scrubber section, where the steel sheet is washed with hot water to remove carried-over pickling acid, is made of Monel®. Monel was chosen for this application because of its excellent resistance to hot pickling acids... an essential quality for low maintenance costs.

Equipment for the new line was manufactured by the Wean Engineering Company of Warren, Ohio, and the Westinghouse Electric Corporation of Pittsburgh, Pennsylvania. The line was designed by the Weirton Steel Company's own engineering department.

If you – like the Weirton Steel Company – have metal problems involving corrosion or high temperatures, remember that INCO's Technical Service Department is always ready to help you solve them.

Monel scrubber section of new Weirton No. 4 Electrolytic Tin-Plating Line. Monel was chosen because of its high resistance to hot pickling acids. Photos courtesy of the Weirton Steel Co., Weirton, W. Va.



End of Weirton high-speed electrolytic tin-plating line, showing finished tin plate being coiled. The line is the largest and fastest of its kind, making the Weirton, West Virginia, plant the world's largest tin mill.

* * *

Although Nickel and Nickel Alloys are being diverted to defense, INCO advertisements will continue to bring you news of products, applications, and technical developments.

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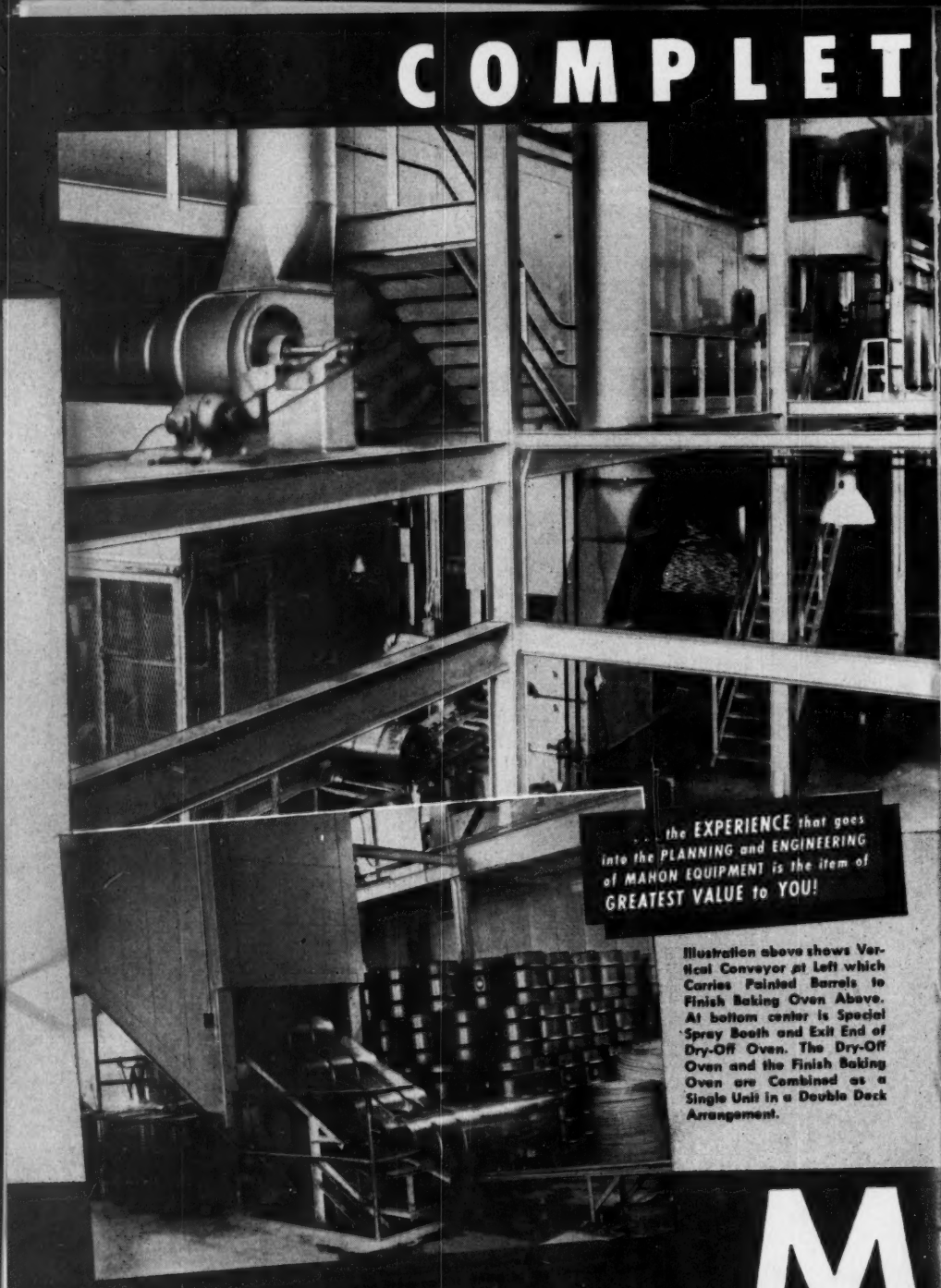

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Illustration above shows Vertical Conveyor at Left which Carries Painted Barrels to Finish Baking Oven Above. At bottom center is Special Spray Booth and Exit End of Dry-Off Oven. The Dry-Off Oven and the Finish Baking Oven are Combined as a Single Unit in a Double Deck Arrangement.

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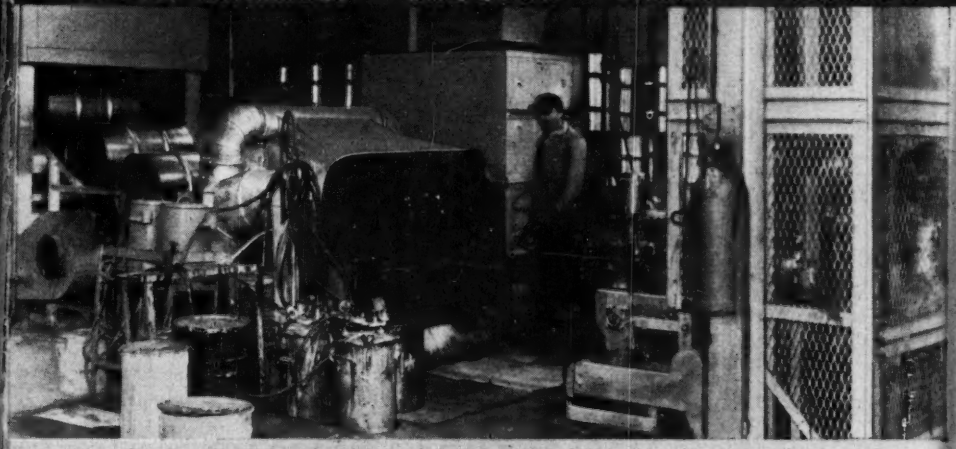

Steel Barrels Emerging from Dry-Off Oven and Passing Through Special Spray Booth. Note Vertical Conveyor at Right.

With MODERN Continuous Processing Equipment Painting of Steel Barrels Becomes a Minor Cost Item!

The finishing system illustrated here was developed in collaboration with the customer's engineers to handle production painting of steel barrels and drums. It consists of two painting production lines each of which includes cleaning and test facilities, a dry-off oven, a special spray booth and a finish baking oven. One of the unique features is the combined Dry-Off and Finish Baking Ovens—these are arranged in a double deck unit located just below the ceiling to conserve floor space. Vertical conveyors carry the barrels straight up as a further measure of space saving. This is another typical example of production planning where new methods and modern equipment have produced better results at lower cost. When you are in need of new finishing equipment—no matter what your requirements may be—it will pay you to consult Mahon, because, Mahon engineers have pioneered development in this highly specialized field for over thirty years . . . their broad experience in every industry where finishing constitutes a major production operation has endowed them with a wealth of technical knowledge and practical know-how not available to you elsewhere. See Mahon's Insert in Sweet's Mechanical Industrial File, or write for Catalog A-650.

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TABLE I

Gloss Definitions Compiled by Luck and Archibald from ASTM and Hunter Interpretations. Sections Italicized Were Selected by Them as Particularly Pertinent with Respect to Photographing the Details of Glossy Panels.

TYPE OF GLOSS		CHARACTERISTIC APPEARANCE		MOST OFTEN USED TO DESCRIBE APPEARANCE OF	GLOSS RANGE	
ASTM	Hunter	ASTM	Hunter	Hunter	ASTM	Hunter
Specular gloss	Specular gloss	Brilliance of highlights, shininess	*Brilliance of specularly reflected light, shininess*	*Paints, surfaces of moderate gloss, dark and chromatic objects*	*Medium glossiness*	Medium gloss
Sheen	Sheen	*Shininess at grazing angles*	Shininess at grazing angles	*Flat paints, papers, and materials of low gloss*	*Low glossiness*	Low gloss
Contrast gloss	Contrast* gloss	*Contrast between specularly reflecting areas and other areas*	Contrast between specularly reflecting areas and other areas	*Papers, mat and semimat finishes, white and light colored materials*	*Low glossiness*	Low gloss
Distinctness of image gloss	*Distinctness of reflected image gloss*	*Distinctness and sharpness of mirror images*	The distinctness and sharpness of reflected images	*Finishes, enamels, lacquers, and all smooth image-reflecting surfaces*	*High glossiness*	High gloss
Absence of bloom gloss	Absence of bloom gloss	Absence of smear or excess semispecular reflection of adjacent highlights	*Absence of smear or excess semispecular reflections adjacent to reflected highlights and images*	*Surfaces in which reflected images and highlights may be seen*	*High glossiness*	High gloss
Surface uniformity gloss	*Absence of surface texture gloss*	Surface uniformity, freedom from visible non-uniformities	*Surface evenness, absence of texture, indicated by difficulty of recognizing presence of surface*	*Glossy materials, finishes and coatings*	*Medium to high gloss*	Medium to high gloss

* Sometimes referred to as subjective gloss.

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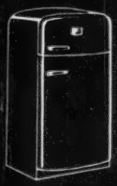
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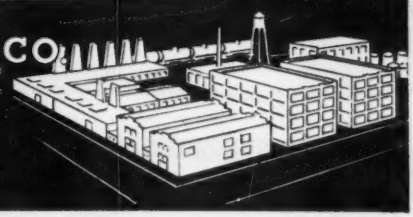

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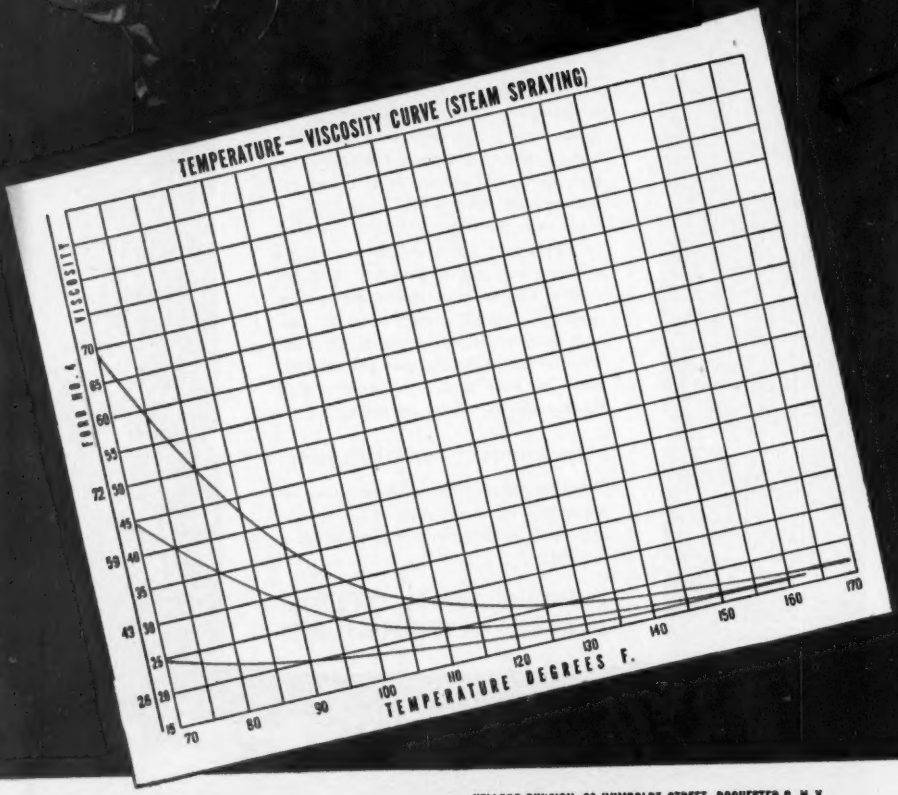

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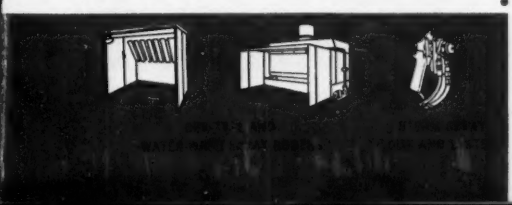

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How then does one see gloss? First, when examining the surface at the angle of reflection, he sees an image of the light source, either distinct or indistinct, according to the degree of gloss. But place some sort of impediment between part of the light source and the reflecting surface, and instantly another factor of gloss becomes apparent—namely, contrast. Photographs of flat glossy objects showing such contrasts are the basis of a method for gloss study used by the Detroit Paint and Varnish Production Club which will be discussed later. According to Luck and Archibald, the entire problem of photographing glossy flat test panels arises from the fact that the panel is glossy. In order to photograph the surface details of such panels, specular reflection must be controlled, and where it is controlled reproducibly, it is possible to present certain pictorial as well as comparative representations of gloss itself, on the same picture with the surface detail.

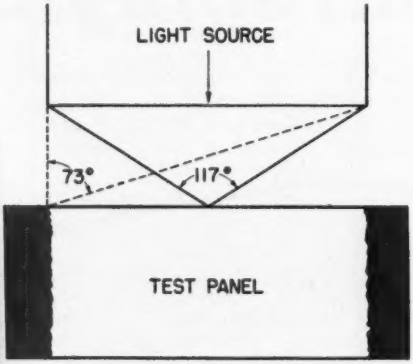

Fig. 2 — Schematic representation of light source reflected from an irregular surface on a glossy panel, as presented by Luck and Archibald before the New York University Symposium on Varnish and Paint Chemistry.

Photographing Glossy Panels

Luck and Archibald pointed out that the reason why surface details may not be photographed in a conventional manner is because a glossy surface will reflect light specularly, and regardless of the intensity of the illumination used, when examining the surface at the specular angle, the specular reflection prevents an adequate view of the surface detail. Thus, it was emphasized that in this instance the camera is no better than the eye, and the picture taken at the specular angle will not reveal the surface detail.

Thus, the surface of a glossy panel may be considered as composed of innumerable reflecting surfaces set at many angles, though not so many reflecting surfaces, nor so small as to result in a mat surface. When the image of a narrow angle source of light is reflected from the glossy surface, only certain angles of the reflecting surfaces are so oriented as to reflect the light specularly, and as a result, what might be called poor illumination actually results in revealing detail because both highlights and shadows may be observed. On the other hand, when a broad angle light source is used, light strikes all or nearly all of the reflecting surfaces, no shadows are formed, and details of the surface cannot be seen. This was illustrated by Luck and Archibald before the Symposium by Fig. 2, which shows a light source reflected from an irregular glossy panel. As is shown, the edges of the light source restrict the angle of illumination to 73 degrees, while the center of the panel is illuminated by a broader angle of light of 117 degrees. Thus, it was postulated that as the distance between the light source and reflecting angle becomes greater, and the angle between the edge of the light source and the reflecting surface decreases, more surface detail is revealed.

This was shown to be true by photographing a panel with the light source close to the panel and then making successive images with the light source at increasing distances from the panel.

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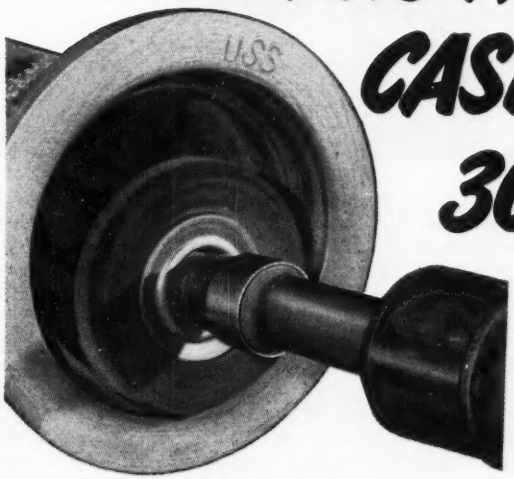

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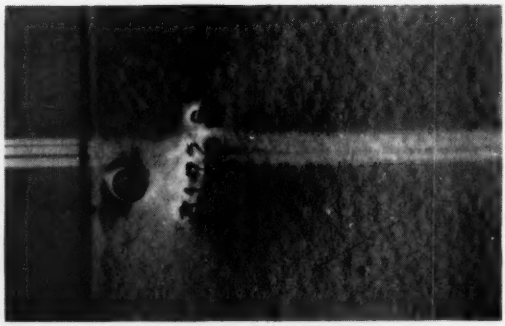

Fig. 4—The black panel shown in Fig. 3, together with a black backed glass, showing distinctness of image reflection. A specular reflection of light source containing a fine and broad shadow line is superimposed on the surface texture image.

Using this technique, it was shown that as the light source is moved further away from the reflecting surface, the edge of the reflected image of the light source becomes less definite, the angle of the edge of the source with the reflecting surface becomes smaller, and simultaneously the details of the edge of the surface become more apparent.

Furthermore, at some distance between light source and reflecting surface all of the light from the light source will be reflected at a small enough angle to reveal the surface detail. However, in such a case the area so revealed will be small and the entire surface of the panel cannot be seen in detail. If, on the other hand, the entire panel could be illuminated with light of the character exhibited at the edge of the reflected image of a light source, the surface detail of a glossy panel could be revealed and photographed. Figure 3 shows a glossy black panel with surface irregularities photographed in such a manner as to utilize what was termed by the developers of this new technique, for lack of a better term, "light from the edge of a light source." It can be seen from this photograph that the entire surface detail is revealed. Other techniques may be used to advantage with this method. In addition to revealing the surface detail of a glossy panel, a specular image of the target may be included in order to reveal the mirror-like characteristics of the glossy surface. Consequently, a small target area with a broad and fine line is also used, together with a piece of thin glass painted black on the back surface, in order to give a basis of comparison. Figure 4 shows the same black panel as shown in Figure 3, together with a black backed glass, showing distinction of image reflection. A specular reflection of light source containing a fine and

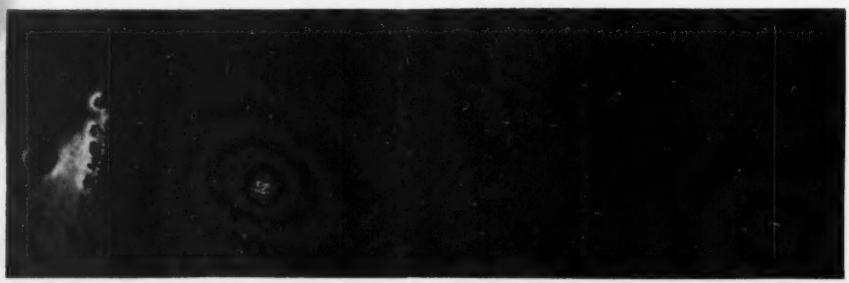

Fig. 3—A glossy black panel photographed in special machine developed by Luck and Archibald for glossy surfaces.

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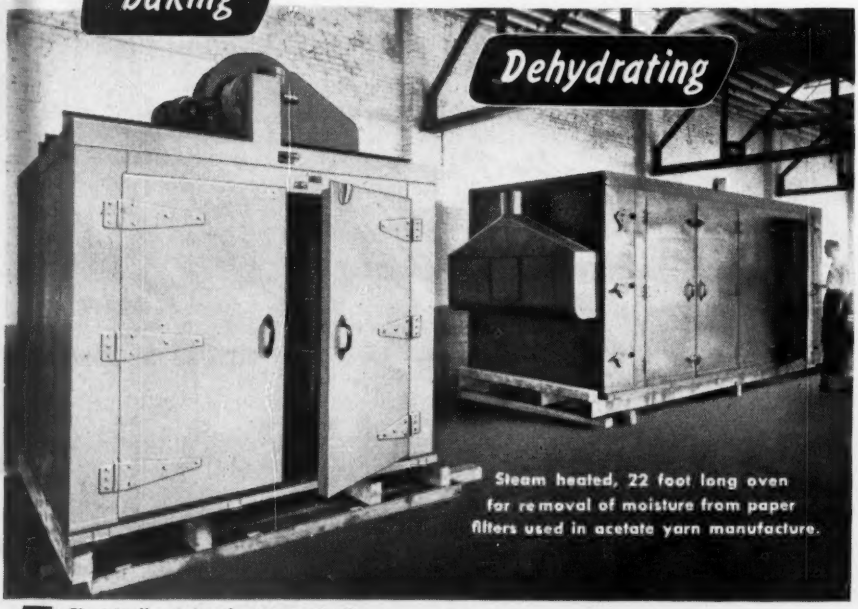

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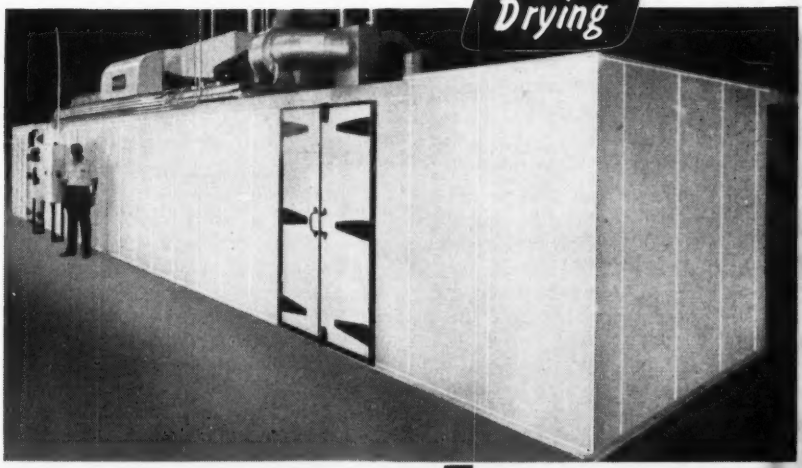

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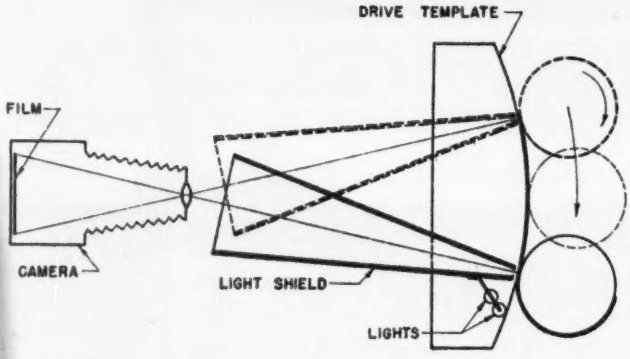


Fig. 5 — Schematic drawing of machine for photographing cylindrical objects which was adapted to photographing glossy panels.

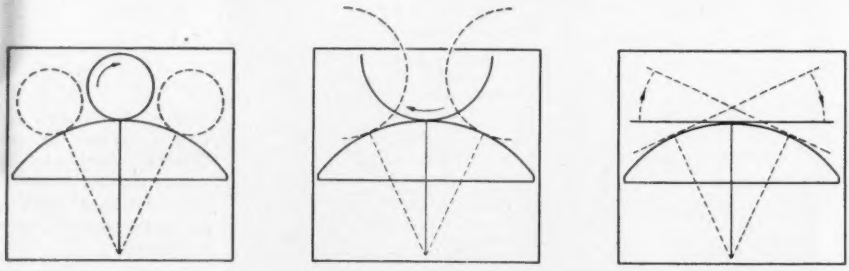
broad shadow line is superimposed on the surface texture image. Figure 4 also shows lack of surface detail on black back painted glass.

Instrument Used

In order to photograph the surface details of a glossy panel, Luck and Archibald developed a special machine. This machine was said to be an adaptation to this particular work of a machine previously devised for photographing the entire outside of a cylindrical surface.

Figure 5 is a schematic drawing of the apparatus. This device is based on the fact that when a cylinder is rolled on a surface the portion of the cylinder in contact with that surface is not in motion and can be photographed. If the generating surface is another cylinder with its axis parallel to that of the first one, then, as the first cylinder is rolled around the second, every point on the first will at some time be stationary at a distance from the axis of the generating cylinder equal to its radius. This principle is embodied in a mechanism that photographs only a narrow portion of the cylinder in the vicinity of the point of contact with a template, and takes a continuous exposure while the cylinder is rolled along at a constant speed.

In Fig. 6 the transition from a cylinder to a segment of a plane is shown to illustrate the point that the same principle used in photographing a cylinder may be used to photograph a plane. Basically, the machine which



The Cylinder. The opened Cylinder. The flattened Cylinder, or plane.

Fig. 6—Illustration showing the transition from a cylinder to a segment of a plane: identical objects' movement may be used to photograph each.

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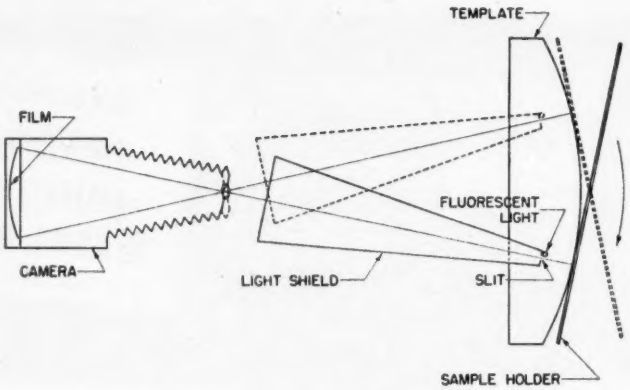

Fig. 8 — Schematic drawing of machine for photographing the surface detail of glossy test panels.

was developed by the experimenters permits photographing a continuum of narrow vertical strips of infinitesimal width of a plane sample from a point directly in front of each strip. It was pointed out that the resulting photograph would compare with a composite photograph of a picket fence made up of separate photographs taken from directly in front of each picket, since only the front surface of each picket would be visible.

Figure 7 shows the machine for photographing glossy test panels. Figure 8 shows a diagrammatic sketch of the apparatus and Fig. 9 shows details of the sample holder. Letters designating parts of the machine are identical in the illustrations. The machine has an arm, **A**, pivoted at one end and free to move only in a horizontal plane around the pivot point a few inches above a flat metal table top. On this arm is mounted a shield, **F**, holding a vertical adjustable slit, **G**, directly over the arm. On the shield, at one side of the slit is mounted the light source,

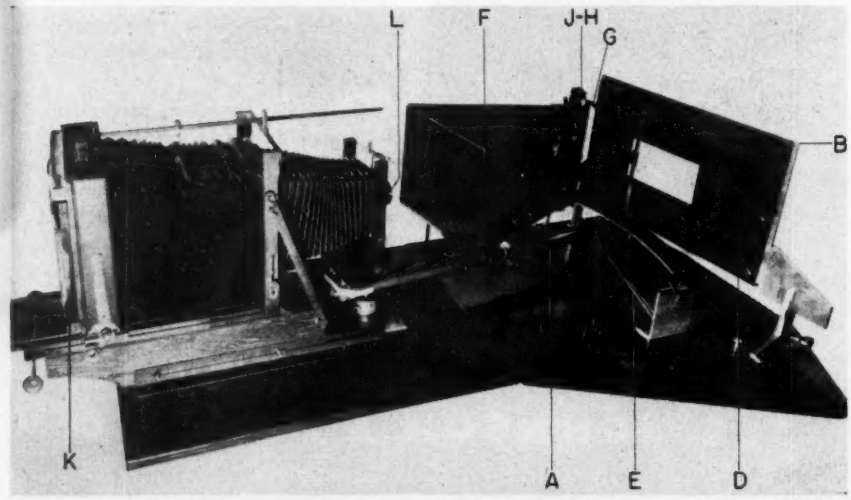

Fig. 7—Side view of machine developed by Luck and Archibald for photographing surface details of glossy panels.

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H, and adjustable shield, **J.** When the arm is moved the slit describes an arc, and the light constantly and uniformly illuminates the area in front of the slit. The camera lens, **L,** is mounted directly over the pivot point and turns with the arm.

The flat sample holder, **B,** is mounted on rollers which run on the metal table top and support the sample holder vertical to the table at such a height that its lower edge is just above the pivoted arm which it straddles. An assembly of three rollers, **C,** one in front of the holder and two behind, is fixed to the moving arm. The three rollers are so spaced that the front one is centered directly over the moving arm and the two back ones are at equal distances each side of the center. These rollers fit snugly against the front and back surfaces of the vertical sample holder. If the arm is moved, the rollers traveling across the lower edge of the vertical sample holder will cause it to turn in such a way as to remain always normal to the arm, and thus, to the axis of the lens.

If a flat surface is moved continuously without slippage in contact with a cylinder so as to cause every portion of the flat surface in succession to touch the cylinder, the contact is identical with that achieved in the cylinder photographing machine. Thus, when this motion is made with the flat surface, each point on it in the plane of movement describes an involute of a circle. It is necessary, therefore, to move the sample holder so as to permit each point to describe its particular involute while maintaining the point of the sample holder directly opposite the slit tangential to the arc being described by the slit.

It was pointed out that this is accom-

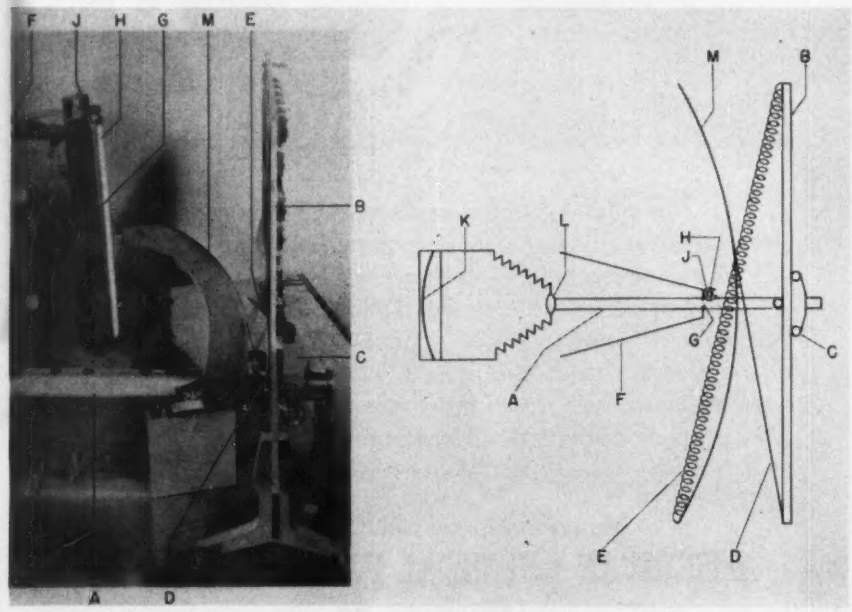

Fig. 9—The sample holder, slit and light source of machine for photographing surface detail of glossy test panels.

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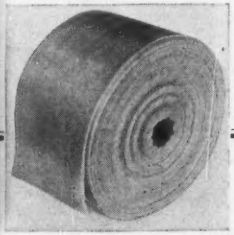
plished by using a template, whose shape is an arc of a circle having a radius equal to the distance from the point of pivot of the moving arm to approximately the surface of the sample holder. This template is firmly fixed, and from one end of the template to the opposite end of the sample holdder a flexible metal strap, **D,** is attached. As the sample holder is turned by the movement of the arm, the metal strap will curve over the surface of the template, thus controlling the lateral movement of the sample holder. In order that this single strap will guide the movements of the sample holder during the entire operation, it is kept under slight tension by the spring, **E,** attached to the sample holder and to an appropriate fixed support. The vertical sample holder then rides on the supporting table, and a shielded slit observable by a lens is swept across the surface of the flat sample. At the same time, a light mounted on the shield, and consequently moving with the slit, illuminates the area of the sample seen by a lens through the slit uniformly.

Modern high-grade photographic lenses are corrected so as to produce a dimensionally true reproduction of a flat object when it is photographed at right angle to the axis of the lens. If, however, the flat panel is photographed so as to maintain each portion of the panel at an equal distance from the lens, dimensional distortion occurs. Luck and Archibald used two means to reduce these distortions: first, the lens was arranged to pivot with the slit, so that only the center of the lens was used; second, a concave film holder, **K,** was made with a radius of 30 inches. It was pointed out that while the latter adaptation will not completely correct distortions of all of the various enlargements or reductions that may be photographed on the machine, it materially aids in maintaining proper dimensions of the most useful sizes.



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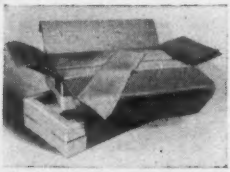

CUT BULK
Already cut and folded, ready to use.

NOW! Tack Cloth in Handy Rolls or Cut Bulk

Now you can get Tack Cloth packed the way it's easiest for you to use—either in 150 yard rolls of 36" wide cloth or in handy cartons—100 or more Tack Cloths to the carton.

No matter which way you buy it, you can be sure that every square inch will *stay* SOFT and TACKY until the very last bit is used up.

The Cut Bulk size is 18" x 36"—folded to 4½" x 18" for easy handling. *All of our Tack Cloth is Spontaneous Combustion-Proof, Lint-Free and Wax-Free.* It's clean and sanitary—*there's no waste.*

Write today for complete information, prices and samples.

BAUGHN CHEMICAL PRODUCTS CO.

The Tacky Wiper Specialists

7019 N. Ravenswood **Chicago 26, Ill.**

Also Individually Packed in Glassine Envelopes — 144 to the Carton

— A WARRANTY OF SATISFACTION IN EVERY CARTON —

For today's stepped-up production

GET FAST, THOROUGH METAL CLEANING with VAPOR DEGREASING

Removes grease and oil in a minute or less . . . simplifies subsequent handling and finishing of parts

FOR a metal cleaning process that combines high production volume and economical operation with low equipment and space costs . . . consider vapor degreasing.

This modern cleaning method is so simple that an average worker can be trained in a short time. Compact, space-saving equipment can be installed and ready for production without the long periods usually necessary for adjustments and "tune-up."

Vapor degreasing thoroughly cleans grease and oil from metal parts of any size or shape, leaves parts clean, warm and dry—ready for inspection, assembly and further processing. Operating costs are low, too, for solvent consumption is almost independent of the amount of contaminant removed.

Trichlorethylene Degreasing Solvent

Under various trade marks, such as "Triclene" D, Du Pont degreasing solvents have been widely used for many years. These solvents are stable . . . the best yet developed by Du Pont for metal degreasing. They stand up against contaminating and destructive materials which may be introduced in degreasing . . . assist materially in carrying out efficient and economical metal cleaning.

SEND FOR FREE BOOKLETS

In this helpful literature, you will find detailed information on the advantages of vapor degreasing, the equipment used, the Du Pont degreasing solvents, and many industrial applications. Just clip the coupon below!

Tune in Du Pont "Cavalcade of America" Tuesday nights—NBC coast to coast

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SOLD NATIONALLY THROUGH DISTRIBUTORS

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Electrochemicals Dept., Wilmington 98, Del.

Please send me your free literature covering the vapor degreasing process and solvents. We are interested in cleaning _____ products.

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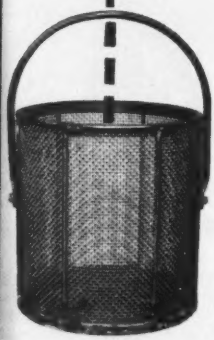
All the bull was cleaned out of this advertisement by one of our baskets



Hoff-Crafter cleaning baskets and racks, standard type or custom made, are just darned good. They're all-welded construction and they cost no more than ordinary ones.

IN YOUR machine it's 10 to 1 the baskets were made by—

For a quotation you'll like, write Hoffman personally.

HOFFMAN COMPANY
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Color Gloss Studies

Luck and Archibald have also conducted color studies of the characteristics of glossy surfaces. They have pointed out that in certain cases color is significant and should be used; however, certain fundamental concepts of color must be understood in order to use color reproductions of glossy surfaces. One point that they have emphasized is that the color demonstrated is obtained by a combination of both specular and non-specular light; furthermore, the relative amounts of specular and non-specular light will vary from point to point on the surface, depending on the surface irregularities of the panel.

Another point that they have brought out is the probability that the character of the pigments used in the surface coating, when illuminated in the special fashion described, will, from example to example, reflect color that is not on first examination readily reconciled with the color of the object when the object is viewed for optimum color perception. The fashion of photographing here exhibited is to use light of such a character as to produce over the entire panel the type of image found between the specular reflection and the reflected image of the target.

Other Methods for Studying Gloss

Highly glossy surfaces are characterized by clear mirror images. The Hunter Gloss Comparator is an instrument which is used to test the surface for its capacity to form clear mirror images. Luck and Archibald pointed out that when the surface coating is thick and transparent, the Hunter Gloss Comparator may include reflections from the supporting surface that will be confused with the mirror image from the surface of the coating.

The Detroit Paint and Varnish Production Club has described a method for making gloss measurements under uniform conditions and in comparison with a set of standards. The device con-

to page 74→

NOW DIAL INFRARED HEAT WITH CHROMALOX

Electric Radiant Heaters

FOR

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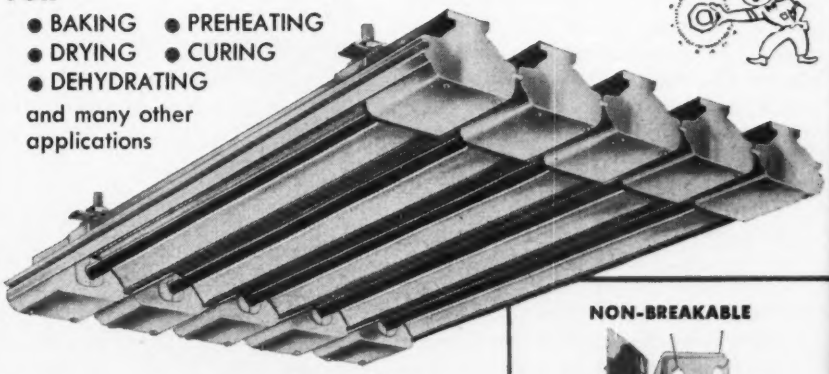
- DRYING
- CURING
- DEHYDRATING

and many other applications



CHROMALOX Electric Radiant Heaters are a new and proved solution to process heat problems. They give you all of these production advantages:

1. **Infrared radiation in longer wave lengths which are absorbed with almost equal speed by all colors and surfaces.**
2. **Uniform blanket of heat without hot spots.**
3. **Infinitely variable heat, adjustable to the work from zero to 100% range, provided by dial controls.**
4. **Quick, low cost oven construction by interlocking units into desired assemblies.**

In addition—all-metal Chromalox Radiant Heaters are unbreakable and immune to shock, vibration, steam and splashed liquids; safe with volatiles.

Why not check this new production line tool? See how it can fit into your finishing operations.

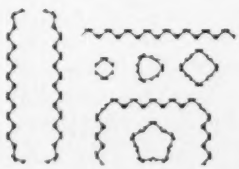
Send for complete Application File

You'll get details on many jobs Chromalox Radiant Heaters are doing in industrial plants; and you'll likely find application ideas which can point the way to added savings and increased production.

NON-BREAKABLE

There's nothing to break—nothing to shatter and contaminate work in process when Chromalox Radiant Heaters are on the job.

VERSATILE APPLICATION



Cross-section views of a few of the many oven designs possible with Chromalox Radiant Heaters.

IC-55

Chromalox electric heat for modern industry

EDWIN L. WIEGAND CO., 7552 Thomas Boulevard, Pittsburgh 8, Pa.

The skill the automotive industry used in plating the gleaming grills and sparkling trim that added glamour and positive protection to modern cars has been diverted to more serious purposes. That same skill is being put to work in plating parts for the nation's defense. And – as in civilian production – Hanson-Van Winkle-Munning's Platemanship is vitally important.

What is Platemanship? It's H-VW-M's unique combination...

...of the most modern and complete laboratory for the development of newer and better plating processes, equipment and supplies...

...of ability to assume complete responsibility for the procurement of every plating need, from buffing compounds, to low-voltage generators, to fully-automatic precision plating conveyors with specially formulated processes...

...of the complete background of knowledge and experience built up by H-VW-M in every aspect of plating, polishing, buffing, cleaning and anodizing.

That's why... as in the automotive field ...all industry invariably turns to Hanson-Van Winkle-Munning for the benefits of Platemanship in both civilian and defense production.

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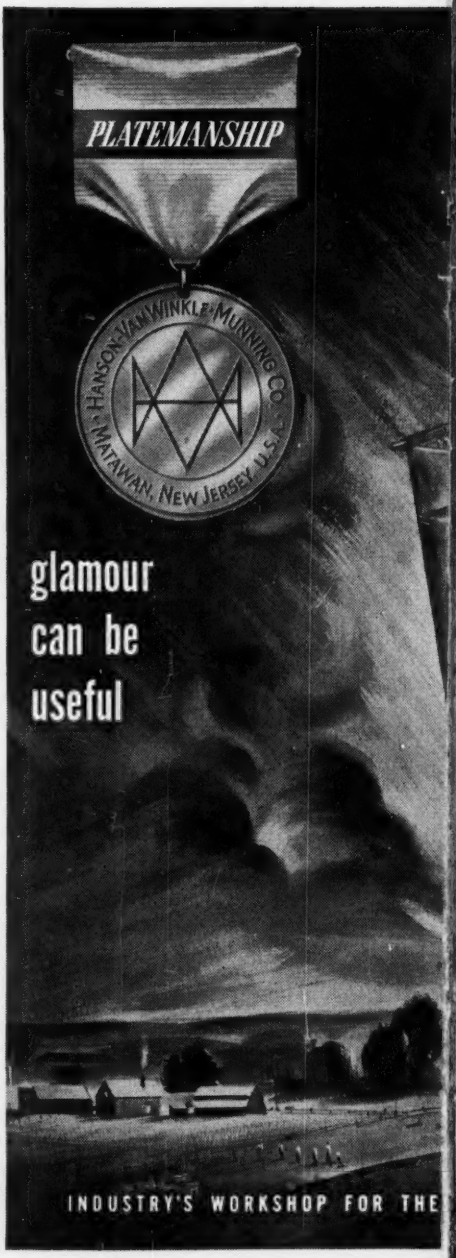

FINEST IN PLATING AND POLISHING PROCESSES • EQUIPMENT • SUPPLIES

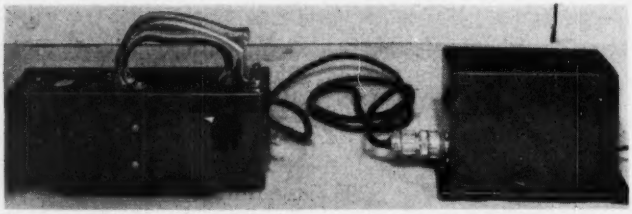

Fig. 11 — A portable 60 - deg. Glossmeter used for gloss measurements. (*Photo courtesy Henry A. Gardner Laboratory, Inc., Bethesda 14, Md.*)

sists of a shallow tray with a hinged cover and a set of ten standard panels. The cover of the box has a glass window, the surface of which is either ground or sprayed with a flat lacquer One description of the apparatus states that the black bars on the cover are ¼ inch wide and 2¼ inches apart. The tray interior is lined with black velvet. The standards are obtained by adding a flattening paste to a glossy lacquer. In order to obtain equal gradations of gloss, it is necessary to add the flattening paste in geometrical ratios. Formulas for both the flattening paste and glossy lacquer for use in preparing these standards have been published. To use these standards they are merely arranged in order in the front of the tray. The sample is then placed in the back, and the intensity of the reflected image (black bars) is compared with the standard.

Figure 10 shows a glossy black metal panel photographed by Luck and Archibald in the fashion described by the Detroit Club. The reflection of bars is produced on the sample by means of a broad diffuse light. The light source, target, and reflections are illustrated. The panel is photographed at the specular angle.

Instruments have been designed which can be used to measure the amount of light reflected from a glossy coated surface, usually in the mirror direction, under certain specified conditions of illumination. One instrument of this type is the 60 deg. Glossmeter. A commercial model manufactured by The Gardner Laboratory is shown in Figure 11. In the case of this instrument the amount of light striking the surface at 60 deg. from the vertical is reflected at 60 deg. in the opposite direction. It is reported that the 60 deg. angle and other characteristics of such glossmeters conform closely to the requirements of Procedure C of ASTM Tentative Method D523-44T for the specular gloss of paint finishes. The geometric conditions of this test were originally selected as those giving the best

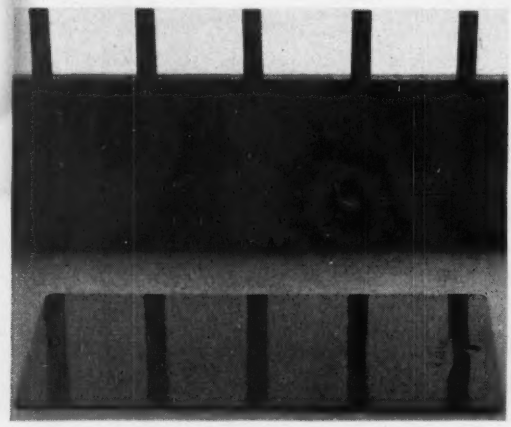

Fig. 10—A glossy black metal panel photographed by Luck and Archibald in the fashion described by the Detroit Paint and Varnish Production Club. The reflections of bars are produced on the sample by means of a broad diffuse light. The panel was photographed at the specular angle.

Here's the *Practical Finish* to REPLACE PLATING

Strathmore Protective Chrome and Metal Coating . . . so essential to the long-life of any "plating replacement" method of metal finishing. Water-white, high solids, will not discolor. Extreme resistance to impact and abrasion. 200 hours of salt spray show no visible break-down of film—exceeds standard chromium specifications. Can be dipped or sprayed.

Baking Type

BAQUIK Clear Coating X2534. Baking range, from 225° F. for 1 hour to 300° F. for 15 minutes. Approved by leading auto manufacturers.

Air-Drying Type

METALBOND Clear Coating SL-300 dries quickly without baking.

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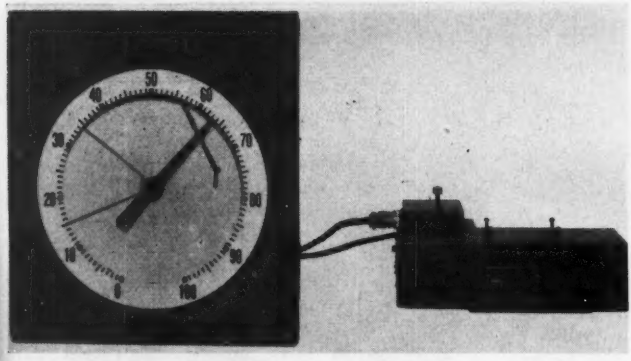

Fig. 12 — A direct reading 75-deg. Gloss Recorder. *(Photo courtesy Henry A. Gardner Laboratory, Inc., Bethesda 14, Md.)*

correlation between instrument settings and visual judgment of the gloss of paints. The instrument's compactness, and the rapidity with which measurements can be made adapt it to production line control methods. In connection with gloss measurements, it is important to note that this 60 deg. Glossmeter measures specular gloss, which is indicative of shininess rather than sharpness-of-reflected-image gloss. Its manufacturer claims that changes of a few per cent in specular gloss, due to weathering, abrasion, chemical attack, and so on, can be detected and measured with this instrument even in cases where the effects can not be observed visually. Figure 12 shows a direct reading 75 deg. gloss recorder. Instruments of this type consist of an exposed head and recorder unit, for the continuous automatic measurement of gloss, reflectance, dimensions of color, and other optical properties of materials.

Portable reflectometers are also available for study of the characteristics of finishes. One instrument manufactured by The Gardner Laboratory provides illumination at 45 deg. and vertical viewing with a visually corrected photocell. These conditions are stated to provide the standard conditions for reflectance measurements on many government specifications and in ASTM Method D771-47. It has been pointed out that measurements with this new apparatus are not satisfactory for opacity or hiding power determinations because the precision is not high enough.

When using either this reflectometer or glossmeter, a standard is first placed under the instrument and the meter adjusted to the standard. The instrument is then placed on the test surface, and the reading made. During any long series of observations, it is advisable to check the instrument with a standard at regular intervals to guard against drift. Instrument readings are most accurate when they are taken rapidly at regular intervals so that effects of photocell and battery fatigue remain constant. Where a series of standards is available, it is recommended that the standard closest in value to the specimens being measured be used for final adjustment of the instrument.

NEW PAINT CHANGES COLOR AS TEMPERATURE RISES. A new type of paint, which changes color automatically at increasing temperatures, is aiding the Socony-Vacuum Oil Company, Inc., in studies of cooling processes for air-cooled internal combustion engines. It is being used by the technical service department, Socony-Vacuum Laboratories, 412 Greenpoint Avenue, Brooklyn.

The paint is formulated to provide fifteen basic shades for original application. It assists in determining proper locations for thermocouples to measure internal heat while an engine is in operation, according to Socony-Vacuum technicians.

When space means $

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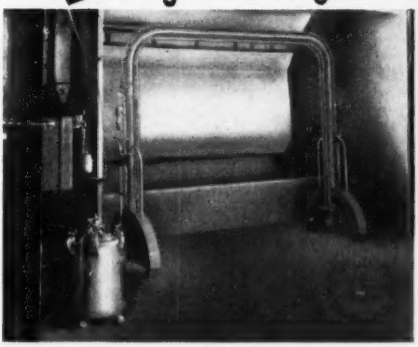

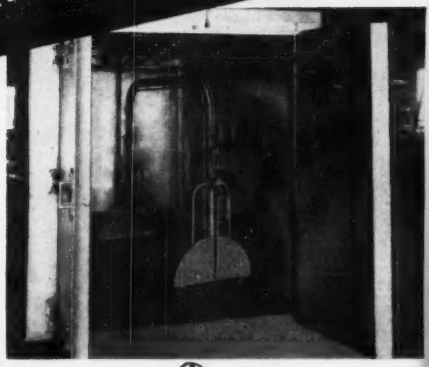

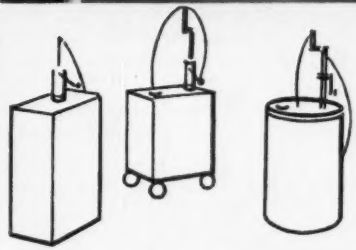

THE FINISHING SYSTEM AT THE PHILLIPS PUMP AND TANK CO. is designed for finishing a variety of objects from a portable carwasher (shown in process of finishing) to pumps and tanks used in service stations. Storage space in this plant is limited. Material has to move quickly from the assembly line through the finishing department to the shipping room. Young and Bertke engineers designed and installed a spray booth and oven that required a minimum of room and facilitated the movement of materials. In installing a finishing system in your plant, let Young and Bertke engineers design it so that you will save both time and money. Write us today.

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PRACTICAL APPLICATIONS *of Modern Products*

Ironrite Simplifies Paint Stripping Operation

By BERT DOGGETT
Paint Superintendent, Ironrite Inc., Mt. Clemens, Michigan

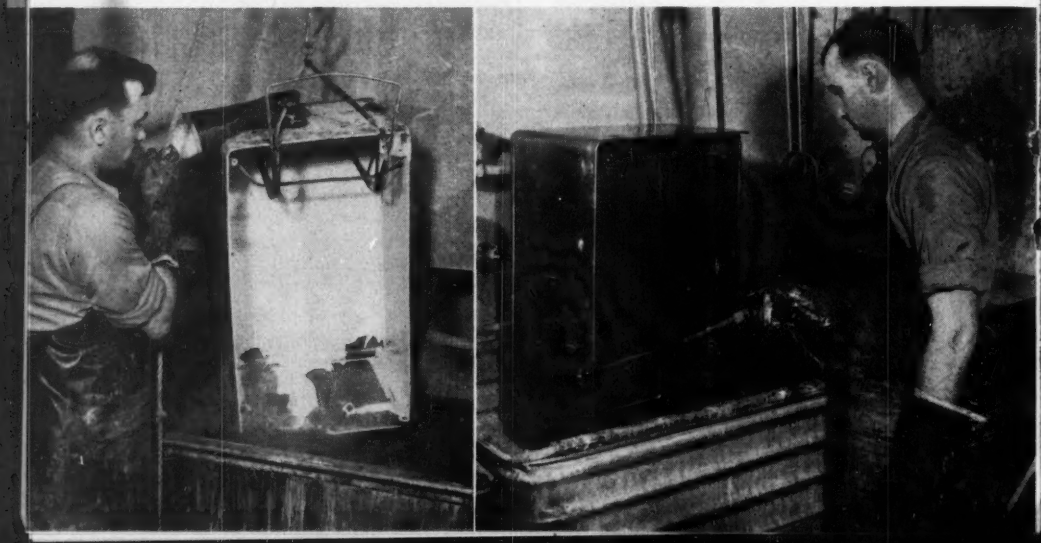
OUR experience with one of the modern additives, used as a booster for caustic solutions normally employed in paint stripping, has been highly successful. Before using the new additive we required four men on two shifts—a total of eight man-days, and our paint rejects still piled up. At the present time we are using one man per shift for the paint stripping task.

Our basic problem revolved around the hand labor needed to remove paint after rejected ware was removed from the caustic solution. In many cases residual pigment was left on the metal surfaces and this could only be removed by hand scrubbing. Under the present system our metal parts rinse clean ready for refinishing.

The process we are using at the present time employs a proprietary stripper (Klem Stripper No. 74)* which is mixed at a ratio of 6 or 7 ounces per gallon of water. To this is added a

* Manufactured by Klem Chemicals, Incorporated, 14401 Lanson, Dearborn, Michigan.

Fig. 1 (left)—A view of the paint stripping department in the plant of Ironrite, Inc., Mt. Clemens, Michigan. Paint finishes are now removed from rejected parts without hand labor through the employment of "Strip-Aid" in the paint stripping solution.
Fig. 2 (right)—When "Strip-Aid" is used as an additive in caustic paint stripping solutions, paint finishes may be stripped completely, leaving no hard-to-remove pigments on the metal. This photo shows residual materials being washed away by a stream of water.



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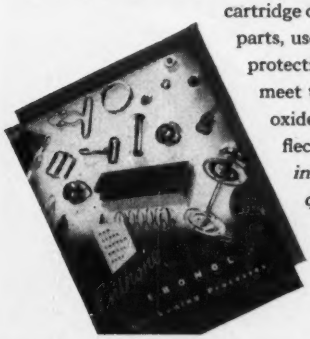
Millions of Guns...



ammunition shells, cartridge clips, shoe eyelets, buckles, buttons, harness hardware, radar parts, used in World War II, received these government-approved, protective black finishes. Enthone Ebonol blackening processes meet today's Army, Navy and Air Force specifications for black oxide coatings on steel, copper, brass and zinc . . . for wear, reflectivity, saltspray, and weathering. NEW EBONOL Booklet *including detailed operating instructions, sent free on request. U. S. Patents*—2,364,993, 2,460,896, 2,460,898, 2,481,854. Canada, 463,852.

Enthone inc

442 ELM STREET NEW HAVEN CONN

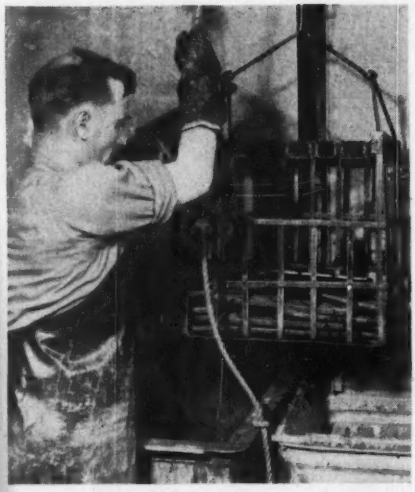


Fig. 3—Paint may also be stripped from small parts without the use of hand labor when "Strip-Aid" is used as an additive to the caustic stripping solution. Small parts are processed in baskets, as illustrated in this photo. *(Photos courtesy Ironrite, Inc., Mt. Clemens, Mich.)*

viscous amber liquid known as "Strip-Aid"* at a ratio of three quarts to 600 gallons of water. With the additive in use we have not only been able to reduce labor costs, but also the amount of stripper normally required.

The use of this new additive has solved another serious problem for us. We are now able to strip finishes from conveyor hooks without difficulty, where this paint formerly had to be burned off, with a resulting excessive loss of hooks and hangers due to warpage. The savings from the use of this new process are obvious.

Another important factor in the process has been a sharp reduction in time. We are now able to strip paints in from 5 to 8 minutes, where the former process required from 15 to 20 minutes. We can handle greater stripping volume, and also save the heat required to maintain solution temperatures over a longer period of time.

It is our opinion that anyone faced with a paint stripping problem should give consideration to the modern additives, such as "Strip-Aid", to speed the stripping process. Our savings in time, materials, and labor have more than warranted the adaptation of the new chemical.

Metal Furniture Manufacturer Utilizes Power Brushing in Surface Preparation for Plating

POWER brushing, for the preparation of metal surfaces for plating,

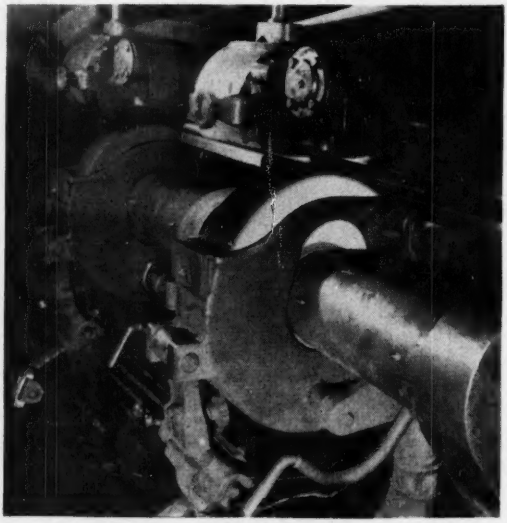
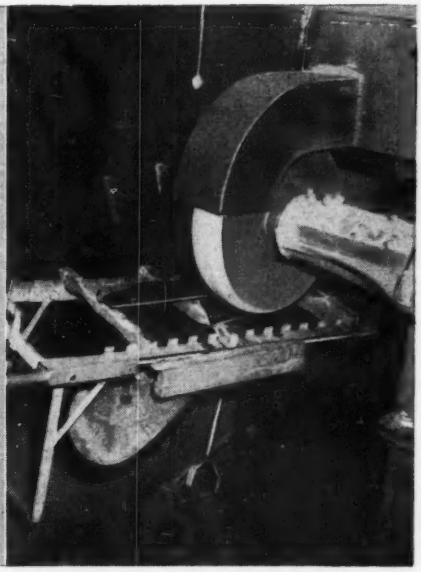


Fig. 1—The cold rolled tube is hand fed into this in-line brushing machine. The drive mechanism on the right rotates the work as it feeds it past the brush face. Brushing time for each tube is approximately 45 seconds.

ALOXITE TPT GRAIN



for high stock removal

Do you find it necessary to remove comparatively large amounts of metal in polishing a certain type of product? Agricultural implements, for example *(as illustrated.)*

ALOXITE TPT aluminum oxide grain by CARBORUNDUM has been specially developed for this service. ALOXITE TPT is a sharp, extremely tough fused aluminum oxide polishing grain with a clean cutting action that reduces finishing time...increases production efficiency and economy. See your CARBORUNDUM representative, or write *today* for illustrated booklet giving full details.

POLISHING GRAIN by

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TRADE MARK

"Carborundum" and "Aloxite" are registered trademarks which indicate manufacture by The Carborundum Company, Niagara Falls, N. Y.

83-3

is providing substantial savings along with increased production for the Sparton Chrome Furniture Manufacturing Co., Philadelphia, Pa.

Fascut brushes, produced by The Osborn Manufacturing Co., Cleveland, manufacturer of industrial brushes and foundry equipment, have provided operational flexibility to the polishing of cold rolled tubing for tubular furniture. Fast off-hand methods or automatic methods are both applicable for polishing either straight or curved surfaces.

The straight cold rolled tube is first polished prior to shaping so as to blend tool marks and prepare the surface for plating.

The tubing, which is four feet long, is hand fed into an in-line polishing machine (Fig. 1). This machine has two heads; first, a set-up wheel, and then Osborn Fascut sections 16 inches in diameter, rotating at 1750 r.p.m., using a grease-bound abrasive compound.

The tube is moved past the brush face by a drive mechanism which rotates the work so that all surfaces receive even finishing. This drive mechanism is set at a slight angle so that it rotates the tube in a clockwise direction against the movement of the brush, and feeds it through the brushing zone. Brushing time for each tube is 45 seconds, after which it is shaped and formed. The polishing operation on the curved surfaces is done by operators on floor stands (Fig. 2).

Fig. 2—The curved surfaces are hand brushed, providing excellent plating surfaces.

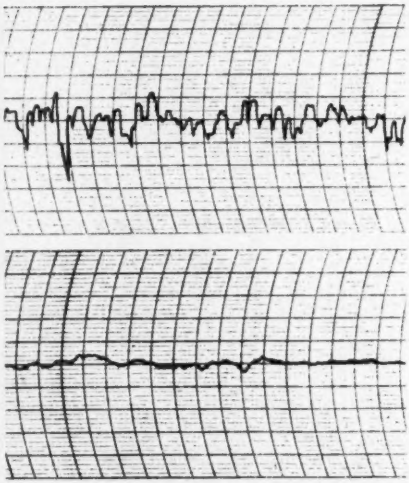

Fig. 3—The upper chart shows in micro inches the roughness of a surface prior to brushing, as measured with a Brush Surface Analyzer. The lower chart shows roughness in micro inches of a surface that has been finished using Osborn Fascut brushes. By uniformly blending the surface roughness, a good plating job is ensured.

The action of the brushing is that of blending imperfections and surface irregularities rather than the actual removal of metal, as is obtained with more rigid polishing tools.

Reducing surface imperfections ensures a good plating job. Sharp edges or groove-like marks tend to build up relatively high current densities at these sharp points, and as a result, plating tends to emphasize the surface irregularities.

LASALCO'S

High Temperature Lucite Cylinder

- Resists all normal plating solutions
- Temperatures up to 190° F.
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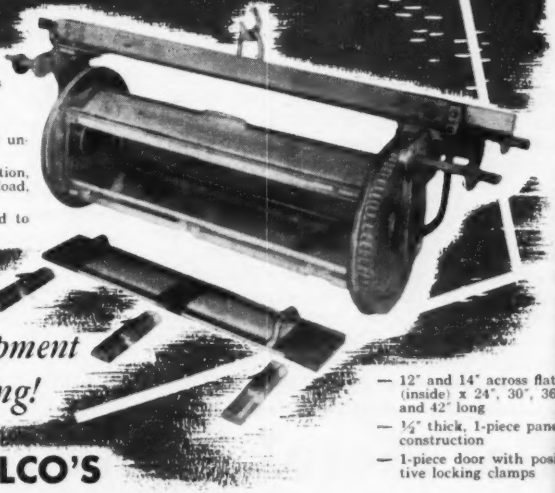
- Full-length 1-piece negative connection, with heavy dangler imbedded in load, gives perfect contact
- Negative contact can be arranged to carry up to 800 amps



Here's Better Equipment For Better Plating!

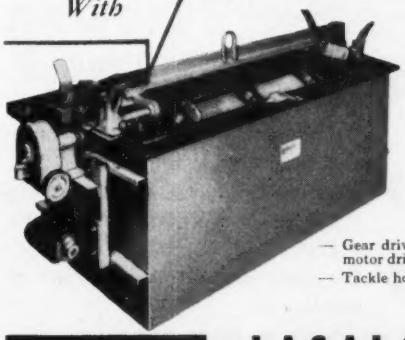
— 12" and 14" across flats (inside) x 24", 30", 36" and 42" long
— ½" thick, 1-piece panel construction
— 1-piece door with positive locking clamps

LASALCO'S

RICHARDS BARREL PLATER

HIGH TEMPERATURE LUCITE CYLINDER

Equipped With



— Gear drive, motor driven
— Tackle hoist

- Nothing plates but the load
- Selective 3-speed drive
- Cylinder when lowered goes automatically into exact position thus engaging driving gears and electrical contact without operator's attention
- Anode rods, conductors, connections and switches are completely insulated from tank.
- Hand or tackle hoist. Ratchet device holds cylinder in any desired position.
- Effortless, speedy raising, loading, lowering or unloading

Greater—Faster—Better—More Profitable Production!

Write For Catalog Information

LASALCO, INC.

2818-38 LASALLE STREET • GRAND 2990 • ST. LOUIS 4, MISSOURI

Examination of surface finish as measured by a Brush Surface Analyzer (Fig. 3) shows the difference between the uniformly blended surface as produced by brushing and the sharpness which is present before brushing.

The finished brushed surface is such that uniform plating will result.

SILVER PLATING AIDS JET-ENGINE BEARINGS. Silver and tin, two metals far apart in value are working closely and effectively in solving lubrication and corrosion problems of high-speed aircraft engines.

The metals are used as thin deposits on precision aircraft bearings produced by SKF Industries, Inc., for jet and piston-type engines. Plating the bronze retainers of roller bearings with silver, explains F. W. Wellons, head of the firm's aircraft division, lessens the chances of one metal's "seizing" another when operating under extremes of speeds and temperatures such as those encountered in jet planes. That is because the silver, one one-thousandth of an inch thick, acts as a "dry" lubricant. These retainers are in bearings that support the jet's main turbine shaft.

The races and rollers of such bearings in piston-type engines are tin plated to prevent water from rusting the highly polished precision parts. The tin coating is even thinner—three one-hundred-thousandths of an inch in thickness.

Constant research being conducted by the electroplating industry has developed electropolishing techniques that have materially reduced polishing and buffing costs and have resulted in brighter and better electroplating of metal surfaces, the American Electroplaters' Society reveals.

For further information on any product mentioned in this issue—use the READER SERVICE CARD between the covers.

Get Metal Parts CLEANER FASTER -- CHEAPER

SEND NOW FOR SAMPLE AND FULL DETAILS ON

PELRON Corporation's Newest EMULSION CLEANERS

- New principle of detergency. Partially emulsified soil floats away —does not remain in machine to re-deposit on work.
- Less material needed for more thorough cleaning.
- Longer usable life, greatly reduced concentration means substantial saving.
- Blend of synthetic, surface-acting chemicals, non-corrosive, completely neutral, fast acting.
- Prevents rust for a number of weeks.

PELRON CORPORATION

FORMERLY CHEMCO PRODUCTS CO., INC.

7740 W. 47TH STREET, LYONS, ILLINOIS

Manufacturers of Industrial Chemicals

Protect grease fittings from *PAINT CLOGGING* with *Lubseals*

SNAP ON "LUBSEALS" BEFORE YOU PAINT!

● LUBSEALS are plastic caps which snap over standard grease fittings, sealing out all foreign matter.

● Snap LUBSEALS over grease fittings before spray painting to prevent paint clogging. After spraying, LUBSEALS may be removed and used over again on successive painting operations.

● Also snap on LUBSEALS when finished machinery leaves your plant. Bright red in color, LUBSEALS protect and flag every grease fitting, keeping out abrasive dust and metal chips for longer bearing life.

● Inexpensive . . . For a penny or two, your machines can be protected.

Free Samples on request. Write—

WILSON PLASTICS, INC.,

SANDUSKY, OHIO

NEWS of the Industry

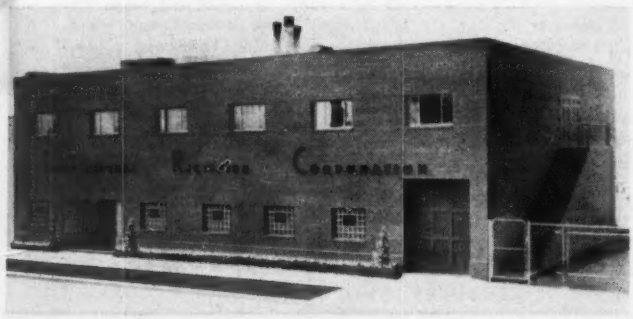
NEW PLANTS

THE CRO-PLATE COMPANY, INC., Hartford 5, Conn., manufacturer of Cro-Size Gages, the Cro-Hone, and the Cro-Plater, has announced completion of its new plant.

One of the most complete industrial chromium plating installations in New England, the company's 75, 100, 500, and 1000-gallon tanks are constructed to handle easily all types of work regardless of size. Also included in the plant are a machine shop and a modern, well-equipped laboratory containing all the intricate apparatus necessary for the periodic analysis of plating solutions and continuing research for the development of new processes.

In order to meet increased production requirements, the **INTERNATIONAL RECTIFIER CORPORATION** has added a second story to its plant located at 6809 S. Victoria Ave., Los Angeles 43, Calif.

This firm manufactures its products in a modern, completely air-conditioned plant with increased facilities for the development and manufacture of selenium rectifiers and photocells.



International Rectifier Corporation

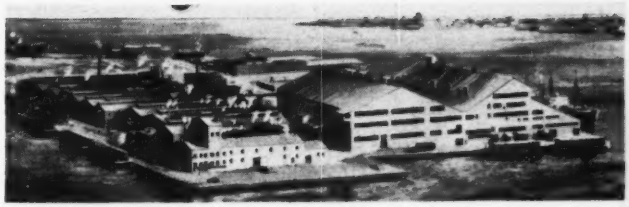
HERCULES POWDER COMPANY has announced the completion of a three-story addition to the main laboratory building at its Experiment Station near Wilmington. The new wing is the major project in a series of expansions made during the past five years.

The addition provides 26 new laboratory units accommodating 51 chemists and increases the research facilities of the main building by more than 60 per cent. It also contains two new air-conditioned laboratories for the testing of paper and textiles.

A specially designed lacquer laboratory will contain a large modern spray booth and related testing equipment. The "hot spray lacquer process" owes much of its present development to the work done at the Experiment Station and has attracted wide interest.

The Experiment Station, core of Hercules research work, is supplemented by many plant laboratories throughout the country. The physical facilities at the research center include more than 40 closely integrated buildings located on a 600-acre tract, near Wilmington.

Richard S. Reynolds, Jr., president of **REYNOLDS METALS COMPANY** of Richmond, Virginia, has announced that the company will build an 80 million dollar aluminum reduction plant in the Corpus Christi area which will have the capacity to produce 150,000,000 pounds of aluminum pig annually. It will be located



New chromium chemical plant of the Mutual Chemical Company of America

in San Patricio County near Gregory.

Work on construction of the plant will be started soon, and it is expected that it will be in operation by the last of the year. About 600 people will be employed.

The **METAL FINISHING DIVISION** formerly located in the **PYRENE MANUFACTURING COMPANY** plant on Belmont Avenue, Newark, has now completed its transfer to enlarged quarters, occupying the Pyrene plant on Empire Street. Equipment of the newest type designed for speed, efficiency and quality control has been installed.

The new plant has about 20,000 square feet of floor space in addition to two enclosed loading platforms. Half the area is devoted to plating, polishing, and anodizing operations. Included in the series of tanks for anodizing treatments there is a special large tank for handling work up to 26 feet in length. There are plating barrels for lead, tin, cadmium, zinc and special set-ups for electrodeposition of various metals. The chromium installation includes two 15-foot tanks with multiple electric controls. All generators and rectifiers are installed in a separate room.

About 50 per cent of the area is utilized for Parkerizing, Bonderizing, Parco Lubrizing, Electrofilm and other chemical processes for metal treatment, as well as a number of spray hoods, baking ovens, vapor degreasers, and other equipment.

In addition to serving the New York-Philadelphia metropolitan areas with job work on all processes, Pyrene licenses or permits other companies along the Eastern seaboard to use Pyrene high gloss nickel, Electrofilm, Pylumin, and other processes.

MUTUAL CHEMICAL COMPANY OF AMERICA has announced the completion of a chromium chemical plant to increase the production of sodium bichromate and other essential chromium compounds. The plant is located on the Baltimore harbor, adjoining facilities constructed previously, and is the largest and most modern chromium chemical plant in the world. As shown in the accompanying air view of Mutual's Baltimore property, the largest of the structures on the right is the sodium bichromate plant. In the new building in the left foreground, other chromium chemicals are manufactured from sodium bichromate.

Construction of a research center and expansion of the research and development activities of **WYANDOTTE CHEMICALS CORPORATION**, a major producer of industrial chemicals and cleaning products, has been announced by Robert B. Semple, president.

The new Research Center will be housed in a functionally engineered two-story structure close to the company's administration building in Wyandotte, Michigan, and will operate under the general direction of Dr. Thomas H. Vaughn, vice president in charge of research and development.

Work in the center will be concerned with research investigations, among others in the fields of atomic tracers, physics, electronics, organic and inorganic chemistry, and detergency in the industrial and metal-cleaning fields.

COMPANIES

RICHARDSON-ALLEN CORP., College Point, Long Island, N. Y., manufacturer of low voltage selenium rectifiers for the plating industry and high voltage rectifiers for other industrial uses, as well as battery chargers and other electrical equipment, has incorporated a Canadian company under Dominion charter to manufacture, insofar as is possible, its complete line.

The Canadian company, **RICHARDSON-ALLEN OF CANADA LIMITED**, is located at 370 Victoria Street, Toronto, with Wesley S. Block, Jr., as president

and Cecil E. Brigham as vice president, both of whom hold the same positions with the parent company. The operations of the Canadian company will be under the direction of the secretary, Kergan Wells, a Canadian resident already known to the plating industry in Canada.

The effects of extreme temperature and humidity on anti-corrosive and fungus-resistant coatings were recently studied directly on the spot by a group of scientists who attended the **ISTHMIAN TECHNICAL CORROSION AND PROTECTION CONFERENCE**, held in the Panama Canal Zone area, Cristobal and Colon.

Highlights of the conference were an inspection of the Panama Canal Locks at Miraflores, Pedro Miguel, and Gatun, and an expedition into the jungles where electronic equipment has undergone outdoor exposure to tropical weather conditions and the presence of jungle life for several years.

According to B. F. Ames, general sales manager, **MAAS & WALDSTEIN COMPANY**, manufacturer of industrial finishes, Newark, New Jersey, Chicago and Los Angeles, who attended the conference, these first-hand studies brought to light much new and valuable information on fungus-resistant and mildew-resistant coatings.

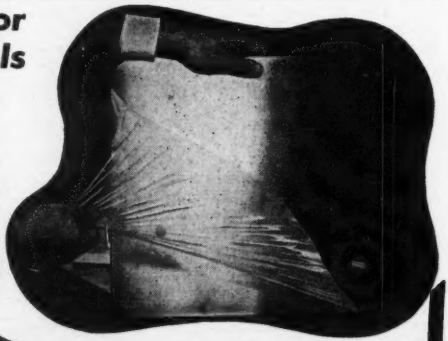
To assist manufacturers in their conservation of critical items through an intensive service program, the field representatives and managers of **DETREX CORPORATION** recently held a series of meetings at Detroit.

Latest manufacturing procedures and finishing specifications for defense materiel, and new product developments were thoroughly covered, so that the field engineers can better serve those companies having conversion problems.

The San Francisco office of **HERCULES POWDER COMPANY** has been moved from 256 Montgomery Street to the Standard Oil Building, 225 Bush Street.

The office handles sales of Hercules products in the Bay area.

A Strippable Plastic for the Protection of Metals



Striplastic is a protective plastic applied by spraying, dipping or rolling. It is used on stainless steels, high polished metal sheets, sheets in cold working or drawing, tools, dies and parts, and on sheets or metal parts before packaging. It protects against scratching and abrasion, and against rust. Also available as a booth coat protection.

THE STRIPLASTIC COMPANY

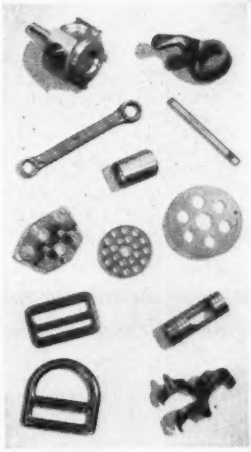
Among many advantages, it is non-toxic, possesses great tensile strength and is easily stripped off in one piece. Write for complete information on this new strippable plastic.

10828 QUEBEC AVE.
CLEVELAND 6, OHIO

ROTO FINISH

GIVES YOU 5 OUTSTANDING ADVANTAGES

for Deburring, Descaling and Finishing Operations



1. Eliminates tedious hand filing, scraping, polishing, deburring, etc. to save many man hours.
2. Provides absolute uniformity in quantity lots.
3. Maintains exacting tolerances on precision parts where no dimensional change is allowable.
4. Imparts a finish mechanically that was formerly considered possible only by hand methods.
5. Low initial cost — requires minimum maintenance. No exhaust systems required.

Send samples for free demonstration

ROTO-FINISH GUARANTEES RESULTS

HERE'S THE WAY IT WORKS

You buy nothing until analysis proves results will benefit you.

LABORATORY ANALYSIS

Your products are analyzed to determine which combination of equipment and materials will do the best job for you at the lowest cost . . . before you make any investment.

RESULTS GUARANTEED

We guarantee to reproduce the same results in your plant that we have produced on your samples processed in our laboratory.

A COMBINATION OF MATERIALS AND MACHINES

When you buy, you get machines and materials that are properly combined for your job.

Roto-Finish COMPANY

associated with The Sturgis Products Co.

3704 MILHAM RD., KALAMAZOO, MICHIGAN

ORIGINATORS OF THE ROTO-FINISH PROCESSES

ENGINEERING KNOW-HOW

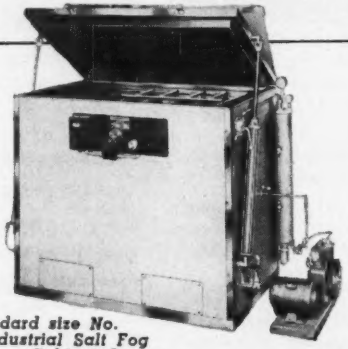
Avail yourself of the unusual engineering skill and ability which is found at the Roto-Finish Company.

CONTINUOUS ENGINEERING SERVICE

Roto-Finish Engineers make periodic visits to your plant to supervise and demonstrate the use of Roto-Finish processes, to train your operators, and to offer helpful suggestions to improve your products wherever possible.

ROTO-FINISH COMPANY, Kalamazoo, Michigan

ACCEPTED
Salt Fog
CORROSION TEST UNITS
BY INDUSTRIAL



Standard size No. 1 Industrial Salt Fog Testing Cabinet. Larger sizes are engineered to suit requirements.

for over-all economy . . .

You have nothing to lose—and much to gain—when you make salt fog tests in an INDUSTRIAL cabinet. These cabinets are built to meet A.S.T.M. B-117-44T salt spray test, also Army, Navy, and Air Force standards.

Consider these features:

- Lucite nozzle with fixed orifice that does not corrode or clog.
- Rubber-lined box for protection against corrosion.
- Accurately controlled enclosed heating.
- Fully insulated for heat economy.
- Air by-pass valve to clear cabinet before inspection of specimen.
- Exhaust flange at rear.
- Air compressor with oil filter. (Cabinet can be connected to other air supply.)
- Air-operated cover lifter (extra).

INDUSTRIAL FILTER & PUMP MFG. CO.

5904 Ogden Avenue Chicago 50, Illinois

SCHUTTE AND KOERTING COMPANY has announced the removal of its offices and plant to Cornwells Heights, Bucks County, Pennsylvania.

Playing a major role in the development of high-pressure power plant auxiliaries, process, and allied equipment, the Schutte and Koerting Company has been in business for over 75 years.

At the annual meeting of the stockholders of **E. F. HOUGHTON & CO.**, Philadelphia, oils, leathers, metal and textile products, the officers and directors were re-elected. These include Aaron E. Carpenter, chairman of the board, and William F. MacDonald, president and treasurer; R. H. Patch, vice president, Operations; D. J. Richards, vice president, Sales; E. A. Carpenter, secretary; C. H. Butler, H. B. Fox, J. T. Eaton, W. K. Barclay, and D. C. Miner, directors.

Other officers re-elected by the board include C. P. Stocke, assistant secretary; M. A. Healey, assistant treasurer; and John F. Maisch, comptroller.

NEW POSITIONS

WILLIAM J. WEED, manager of sales and **LOUIS E. BAUER**, manager of production for Niagara Alkali Company,

William J. Weed (left), Louis E. Bauer

have been elected vice presidents of the company. Mr. Weed has been with the company since 1913 and Mr. Bauer since 1917.

Mr. Weed has served as a director of the company since 1941. He is a past

EXOLON ABRASIVES

THE *Ultimate* CHOICE FOR *Efficient* POLISHING

• For the finest metal finishing jobs use sharp, durable grains of EXOLON RST (aluminum oxide). Careful grading, shaping and magnetic separation assure an abrasive product that gives you highest efficiency in the polishing of all types of tough metals, including spring steel, sheet metal, cold rolled stock, forgings and stainless steel.

Ceramically coated for strongest adhesion to the set-up wheel. The tough abrasive features of EXOLON RST are basic requirements for fine metal finishing.

Write for complete information on EXOLON Abrasives Today

THE EXOLON COMPANY

943 East Niagara Street **Tonawanda, New York**

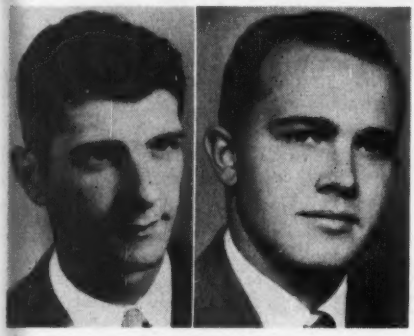
Manufacturers of SILICON CARBIDE *and* ALUMINUM OXIDE ABRASIVES

trustee of the Chemists Club of New York, and a member of the New York Board of Trade, Synthetic Organic Chemical Manufacturers Association, Sales Executives Club of New York, and other organizations.

Mr. Bauer, who graduated from Brown University in 1916, is a member of the Niagara Falls section of the American Chemical Society, and of the Chemists' Club of New York. With his election as vice president of Niagara Alkali, he also has been made a director of the company.

Announcement has been made by the Hanson-Van Winkle-Munning Co., Matawan, N. J., that **HERBERT W. MARX** and **CALVIN E. A. SOLLA** have joined the sales force.

Mr. Marx attended Michigan State College, majoring in engineering. After service with the Marine Corps, he worked with a large automobile company in the



Herbert W. Marx (left), Calvin E. A. Solla

metallurgical laboratory, performing metallographic examinations and physical tests.

Mr. Solla served two years with the Army and later attended Lafayette College, graduating in 1950 with the degree of Bachelor of Science.

After completing a training course in the laboratory and plant of H-VW-M, Mr. Marx will now serve in the field with headquarters in Detroit and Mr. Solla will serve at 258 Park Square Building, Boston, Massachusetts.

Turco Products, Inc., Los Angeles, Calif., has announced the appointment of **JOSEPH HART** as manager of the Metal

Alfred M. Simbro (left), Joseph Hart

Processing Sales Division. In this position Mr. Hart will act as special sales representative and technical advisor to the metal processing and general manufacturing fields.

A graduate of the University of Illinois, Mr. Hart has had 25 years' experience in the chemical field. He is a member of the American Chemical Society and the American Electroplaters' Society.

DAN T. BUIST was appointed national sales director to succeed **LOU H. MOULTON**, retired vice president. **STEWART B. VAN DYNE** was appointed administrative assistant, and **DAN T. MILLER** as co-ordinator of sales, both newly-created positions.

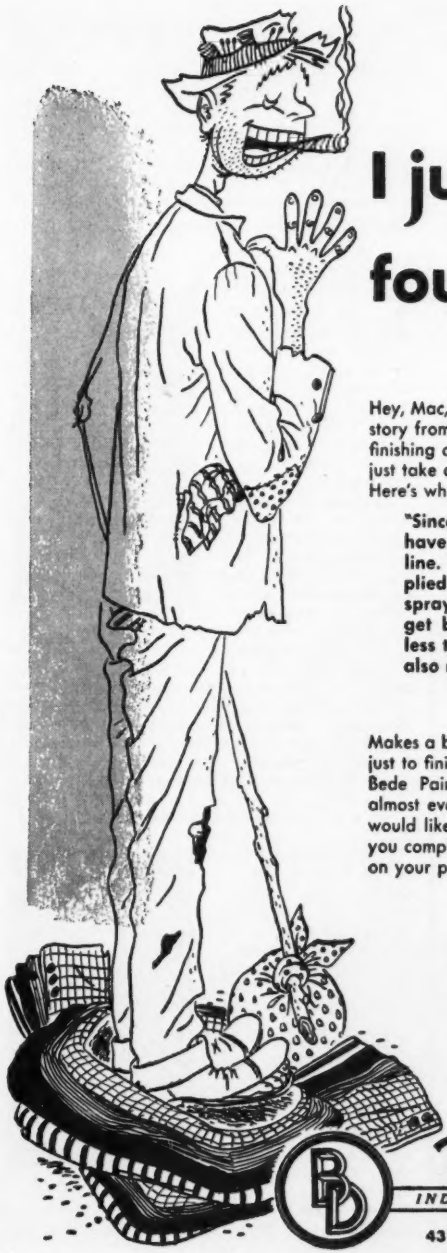
Also announced was the appointment of **ALFRED M. SIMBRO** as Philadelphia district manager. Mr. Simbro has been with Turco since 1942 when he began as a service engineer. In 1946 he became manager of Turco's Building and Institutional Division.

Mr. Simbro replaces **SAM B. HEWLINGS** who has been advanced to a special assignment.

Appointment of **JOHN W. NESTOR** as assistant manager of the Finishes Division of the Du Pont Company, succeeding the late M. A. Dibble, has been announced by Matt Denning, manager of the Finishes Division.

It was also announced that **JOSEPH B. DIETZ**, former manager of industrial sales, becomes assistant director of sales, and **WILLIAM P. FISHER**, formerly assistant manager of industrial sales, now becomes manager.

Mr. Nestor joined Du Pont in 1927 after graduation from the University of West Virginia in chemical engineering. Mr.



I just dropped four coats!

Hey, Mac, you're stealing our stuff. We got the same story from a fellow who dropped four coats from his finishing operation by using a Bede Paint Heater. So just take a back seat while we tell the folks about it. Here's what the guy said (and we quote) .

> **"Since installation of the paint heater, we have doubled our production on the spray line. With the cold spray process we applied six coats of lacquer. With the hot spray process we apply two coats and get better coverage. We also use 50% less thinners and on top of this, we have also reduced re-work to a minimum."**
>
> **Factory Manager,**
> **Dental Manufacturing Co.***

Makes a better story than yours, doesn't it, Mac. And just to finish it off we may as well tell everybody that Bede Paint Heaters can give similar results with almost every type of finishing material. If you folks would like the whole story, just write us. We'll give you complete information—and there's no obligation on your part.

*Name on request

WRITE TODAY for free 8-page Bulletin and Article giving the complete facts about hot spray.

BEDE PRODUCTS Inc.

INDUSTRIAL FINISHING SPECIALTIES

4311-A RIDGE ROAD • CLEVELAND 9, OHIO

Dietz, a graduate of Lehigh University in chemical engineering, joined the company at the Philadelphia paint plant and laboratory in 1924. Mr. Fisher is a graduate in chemical engineering of Massachusetts Institute of Technology. He joined Du Pont at Parlin, New Jersey, in 1926.

Hilo Varnish Corp., Brooklyn 6, N. Y., announces that **JAMES WILLIAMS** will take over as industrial sales manager, with particular emphasis on work in the field with the salesmen.

JOHN H. SCHUMANN, who has had considerable selling experience in addition to his sales direction work, will take over the Hilo Connecticut territory.

WILLIAM L. SCHWALB, for many years active in factory management and contact with raw material salesmen through purchasing, will take over the Hilo industrial selling field in New Jersey north of Trenton.

ALBERT J. LEGUORI has been appointed factory superintendent. He had long experience at similar work in World War II, which will prove valuable in Hilo's work toward government preparedness.

SIMON CHIPKIN will continue as production manager.

MRS. MARIE SPEDE, who during World War II was general secretary and assistant on all research activities, will take over factory production reports and similar activities.

ANTHONY WEISS, who had long been in Hilo production and in the purchasing division, will take over routine purchasing and costing.

W. Harold Douglas

Appointment of **W. HAROLD DOUGLAS** as assistant director of Pittsburgh Plate Glass Company's paint division at Los Angeles has been announced by E. D. Griffin, vice president.

Joining the company in 1918, Mr. Douglas served as an assistant to the Oakland district manager during the war. He was named Pacific Coast purchasing agent during 1944, and prior to his current appointment had served as manager of sundry sales. As assistant divisional director, his headquarters will be at Pittsburgh's new paint producing plant, 465 Crenshaw Boulevard, Torrance, California.

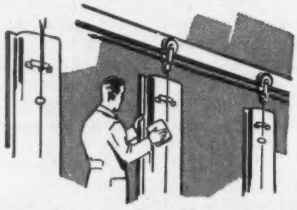
Lawrence V. Nagle

Election of **LAWRENCE V. NAGLE,** vice president and national sales manager of The Udylite Corporation, to the board of directors of the firm, was announced by L. K. Lindahl, president.

Mr. Nagle has been associated with The Udylite Corporation since 1927 when he started as a salesman in the Detroit area. He was appointed Michigan sales manager in 1938 and named chief of national sales in 1944.

DUST-ALL Tack Rag

for better, cleaner finished jobs



Remove the specks, lint, dust from surfaces to be painted; wipe them off with a Dust-All Tack Rag; be sure of fine, blemish-free, finished jobs.

Get the Dust-All Tack Rag in the familiar Red Checkered Bag; also available in 150-250-500 yard rolls.

HARDING
Manufacturing Co.
10634 GRATIOT AVE.
DETROIT 13, MICH.

Hot Lacquer

PUBLISHED PERIODICALLY BY HERCULES POWDER COMPANY IN THE INTERESTS OF BETTER FINISHES AND FINISHING

Angelus Furniture Mfg. Co. Says... "Hot Lacquer Beats Any Other Finish"

Hot Lacquer Gives Angelus Furniture Finishes More "Build" With Fewer Gun Passes

From a 10-acre Los Angeles plant, Angelus Furniture Manufacturing Company is bringing into countless homes Early American Traditional Masterpieces through modern mass production methods. Only recently, this company further stepped up its mass production efficiency, made the quality of its finishes even better—by changing to the hot-spray lacquer process.

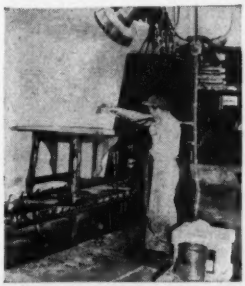
Mr. Henry Grieninger, Supervisor of Finishing Operations for Angelus, is enthusiastic over his company's changeover to the hot-spray lacquer process. Comparing hot lacquer with the regular cold lacquers which Angelus used for many years, and with low-bake synthetic finishes which were also tested, he says, "The most important reason why we go for hot lacquer here is that one coat equals one-and-a-half or even two coats of ordinary lacquer. The high solids in hot lacquer do not penetrate as far into the wood as does cold lacquer during the cooling out process. Consequently, hot lacquer films have an extra 'build' on the surface. This superior surface gives us a better sheen, cuts down the cost of rubbing in some cases as much as 50%. Hot lacquer lays on nicely with much less overspray, and much better coverage. Hot lacquer retains all the advantages of easy 'touch-up' characteristic of cold lacquer and introduces no repair difficulties. We are saving all along the line in finishing material, thinner, operating overhead; and getting fewer rejects, better quality finishes."

Hot lacquer finishes have all cold lacquer's unique combination of properties including fast-dry, ease of sanding and polishing, print resistance, and variety of finishing choices. In addition, Angelus found that its glossy hot lacquer films are much more impervious to cold checking and cracking.

Free Booklets on Hot Lacquer

Hercules offers detailed information on hot lacquer, the types of heating equipment available, and the performance record of hot lacquer in many industries. There is also promotional material that can be used by lacquer manufacturers. Write for copies of current literature.

HERCULES POWDER COMPANY
INCORPORATED
927 Market Street, Wilmington, Delaware



Workman gives a table the gun with hot lacquer.

Front view of main building of Angelus Furniture Manufacturing Company, Los Angeles, California. One of the largest and most complete plants of its kind in the west, the company occupies an operating floor space area of 350,000 square feet.

CL51-2

HONORS

DR. WILLIAM BLUM, Chief of the National Bureau of Standards Electrodeposition Section, was recently honored by the Electrodepositors' Technical Society of London by his election as an honorary member. The Society, consisting of chemists, metallurgists, and other specialists in the electroplating field, has elected only six honorary members in its twenty-six years of existence.

Dr. William Blum

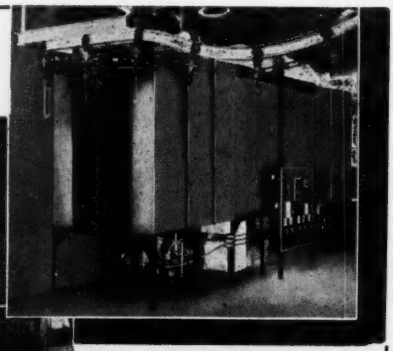
Dr. Blum has been at the Bureau since 1909 and has done research in electrodeposition, including electroplating, electrotyping, and electroforming. He has also contributed to the field of analytical chemistry. He is a member of the American Chemical Society, the American Society for Testing Materials, and an honorary member of the Electrochemical Society, and the American Electroplaters' Society.

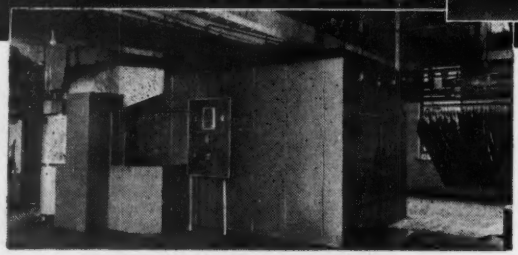
KIRK H. LOGAN, research engineer of the Cast Iron Pipe Research Association, Washington, D. C., received the 1951 Frank Newman Speller Award, and **H. H. UHLIG,** head of the Corrosion Laboratory, Massachusetts Institute of Technology, Cambridge, Massachusetts, received the 1951 Willis Rodney Whitney Award. The awards are given yearly by the National Association of Corrosion Engineers, Houston, Texas. The Speller Award is given for contributions to corrosion engineering and the Whitney Award for contributions to the science of corrosion.

Mr. Logan, long active in the National Bureau of Standards investigating underground corrosion, currently is experimenting with methods to prevent corrosion. Dr. Uhlig is editor of the "Journal of the Electrochemical Society" and author of many published papers on corrosion.

for efficient straight-line production—get a

LANLY CONVEYORIZED OVEN





Lanly experience embraces the designing of many such ovens for a large variety of purposes.

A letter or phone call will make our counsel available without obligation. Write for literature.

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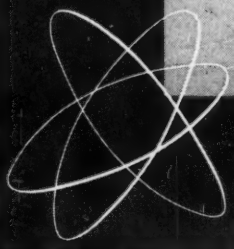

Baker & Co., Inc.

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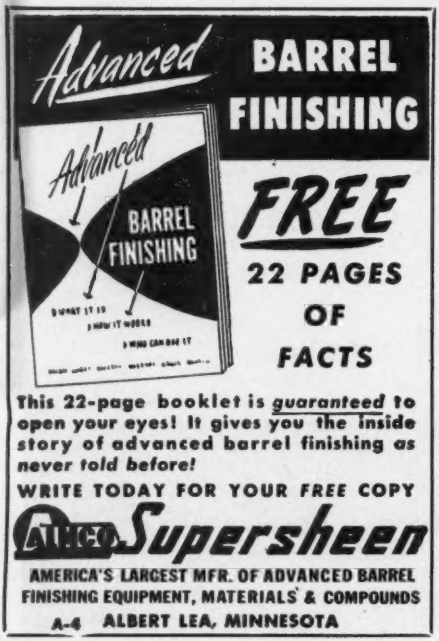
The Bede Paint Heater has been awarded the "Modern Designs" citation by Design News Magazine for "general excellence in mechanical design." The award was presented to **JAMES A. BEDE**, president of Bede Products, Inc., Cleveland, Ohio, who developed the heater.

In presenting the award, John E. MacArthur, district manager of the design publication, called attention to the main purpose of the award, to pay "tribute to the designers of a machine that is noteworthy for efficient performance of its function."

The present model Bede Paint Heater was designed and produced in production quantities in 1949. It is the first paint heater to use aluminum as a heat transfer medium—making the paint heater completely explosion-proof—and is the first paint heater to be approved by Underwriters Laboratories.

Twenty-one awards, fourteen for outstanding sales records and seven for fifteen or more years of continuous service, were presented to employees of The Udylite Corporation at the firm's annual sales meeting in Detroit, February 26.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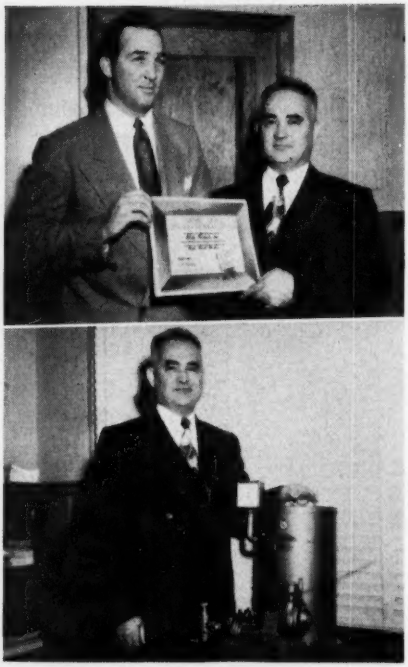

(Top) Presentation of Modern Designs Award Plaque to James A. Bede, president of Bede Products, Inc. (right), by John E. MacArthur of Design News Magazine. (Bottom) James A. Bede with Bede Circulating Paint Heater which won the Award.

L. K. Lindahl, president and L. V. Nagle, vice president and national sales manager of the plating supply and equipment company, made the presentations following a banquet at the Fort Shelby Hotel. A special award, a gold pin for 25 years of service, was presented to **MR. LINDAHL** by C. H. Reeme, treasurer. **W. J. CLUFF**, president of Frederic B. Stevens, Inc., a subsidiary of The Udylite Corporation, was presented a gold watch by Mr. Lindahl in token of fifty years of service with the Stevens organization.

Seven salesmen who topped the million dollar mark in sales for 1950 were given awards signifying membership in the Udylite "Million Dollar Club." They were: **LARRY STOCKWELL**, Detroit; **DAVID STOCKTON**, Chicago; **JIM FITZGERALD**, Detroit; **VINCENT KELLY**, Indianapolis; **JOE HOEFER**, Detroit; **LOU MINBIOLE**, Detroit; and **WILLIAM MOYER**, Philadelphia. Seven

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Whether removing burrs on huge castings or putting a fine finish on relatively small surfaces, National's "Model 400" will do the job better and faster. Has a 3/16" orbital stroke . . . operates at 5000 to 6000 rpm . . . weighs only 4 lbs. . . . costs $79.50. Reliable . . . powerful . . . will not stall. Write for full details today or see your dealer.

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other Udylite salesmen who were honored for total sales of more than one-half million dollars last year were: **WILLIAM YOUNG**, Cincinnati; **HARVEY ZENS**, Detroit; **JIM CLIFFORD**, New York; **ED S T A C K**, Chicago; **WILFRED MOFFATT**, Cleveland; **G. WOODRUFF** and **A. SCHUENEMANN**, Cleveland.

Employees who were honored with awards for fifteen years of service were: **H. J. WARD**, Detroit district sales manager; **WILLIAM JACKSON**, Detroit; **DR. R. B. SALTONSTALL**, Detroit; **JOHN PEARSALL**, Cleveland; **LLOYD WITHINGTON**, Detroit; **HERMAN MARASUS**, Detroit; and **VINCENT ZOBEL**, Detroit.

TRAINING COURSES

Leading industrial authorities will join members of the M.I.T. faculty to present a one-week **INTENSIVE COURSE IN CORROSION** at the **MASSACHUSETTS INSTITUTE OF TECHNOLOGY** June 18-23, 1951, according to Professor Walter H. Gale, director of the M.I.T. Summer Session. Principal purpose of the event will be to bring new information about corrosion control to men in industry.

One of a series of special activities to be held at M.I.T. during the coming summer, the course will be under the direction of Professor H. H. Uhlig, in charge of the Institute's corrosion laboratory. The course will cover the characteristics and mechanisms of corrosion and corrosion control. On the schedule are discussions of the design of equipment, chemical treatment of the environment, cathodic protection, and selection of coatings and alloys economically feasible for reducing corrosion losses.

Further information may be obtained from Professor Gale, Room 3-107, Massachusetts Institute of Technology, Cambridge 39, Massachusetts.

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MEETINGS

The **INDIANAPOLIS BRANCH** of the **AMERICAN ELECTROPLATERS' SOCIETY** will hold its **ANNUAL EDUCATIONAL SESSION AND D I N N E R DANCE** at the Indianapolis Athletic Club on April 28. Tickets are $5.00 each, and may be obtained from R. C. Bruck, 849 Massachusetts Ave., Indianapolis, Ind.

During the educational session, which begins at 2 o'clock, papers will be presented by speakers from the Aluminum Company of America, United Chromium, Inc., and the Darco Department of the Atlas Powder Company.

THE MILWAUKEE BRANCH, AMERICAN ELECTROPLATERS' SOCIETY, will hold its **ANNUAL MEETING** and **BANQUET** at the Schroeder Hotel, Saturday, April 28.

Beginning at 2:00 p.m., the symposium, "Finishing the Defense," will consist of the following speakers and subjects: Dr. William Blum, National Bureau of Standards, Washington, D. C., "Specifications for Defense Plating and the General Situation as Regards to Civilian Plating"; Carroll O. Hutchinson, technical service director, Nubian Division, Glidden Company, Chicago, Ill., "Preparation of Metals for Organic Finishing—Specifications for Organic Finishing and Post Treatment of Metal Surfaces for Defense Applications"; and Myron B. Diggin, technical director, Hanson-Van Winkle-Munning Company, Matawan, N. J., "Plating to Meet Today's Conditions."

Dinner will begin at 7:00 and will be followed by a floor show and dancing.

Tickets at $6.50 each may be purchased from Robert J. Steuernagel, chairman, in care of S. K. Williams Co., 2370 N. 32nd St., Milwaukee.

The **12th ANNUAL NEW ENGLAND REGIONAL MEETING** of the **AMERICAN ELECTROPLATERS' SOCIETY** will be held Saturday, April 28, at the Hotel Taft, New Haven, Connecticut. Tickets are $6.00 per person, and may be obtained from E. V. Collins, Box 127, Bantam, Connecticut.

Speakers for the technical session, which begins at 2:00 p.m., will be W. D. Starr, The Lea Manufacturing Company, "N.P.A. Regulations Affecting Plating"; F. A. Lowenheim, Metal & Thermit Cor-

Developing an exclusive, decorative finish . . . especially for your product . . . is the prime consideration of our expertly-staffed Creative Studio. Here, artists with the talent and experience necessary to accomplish this end, work diligently on your finishing requirements until they come through with a coating destined to increase sales by making your merchandise outstanding.
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poration, "Plating of Tin-Zinc Alloys"; A. D. Squitero, Hanson-Van Winkle-Munning Company, "Iron Plating"; and Harry Sanders, Enthone, Inc., "Specification Finishing of Aluminum."

At 7:00 p.m. the banquet will be held, followed by a floor show and dancing.

THE GALVANIZERS COMMITTEE, which is sponsored by the **AMERICAN ZINC INSTITUTE,** will hold its 25th meeting in St. Louis, Missouri, May 21-22, according to Chairman L. C. Flickinger, of Youngstown Sheet & Tube Company.

W. L. Diehl, assistant superintendent of galvanizing at the Steubenville, Ohio plant of Wheeling Steel Corporation, heads the program committee for the occasion, which will be held at the Hotel Statler coincidentally with the annual meeting of the American Zinc Institute.

SOCIETIES

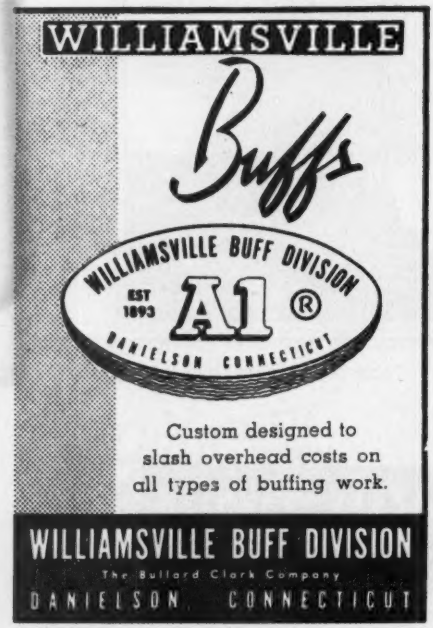
The 6TH ANNUAL EDUCATIONAL SESSION of the **DAYTON BRANCH, AMERICAN ELECTROPLATERS' SOCIETY,** was held March 3, 1951, at the Biltmore Hotel, Dayton, Ohio. William J. Neill, A.E.S. national president, served as honorary chairman for the meeting and introduced the speakers.

S. M. Martin, field engineer, United Chromium, Inc., presented a talk on "Engineering Aspects of Plating Room Layout." Mr. Martin surveyed the problem of designing a plating room, mentioning the various considerations involved in the order in which they should logically receive attention. He illustrated the points made in connection with the several topics discussed by examples from his experience as a field engineer. Mr. Martin pointed out that in planning a plating room, production requirements and article size should be considered, as well as work storage space, solution storage space, rack design and maintenance, tank linings, power source, exhaust systems, and waste water treatment. He discussed ways in which recording temperature control instruments could assist the shop supervisor, pointing out that automatic temperature control is needed now more than ever. He discussed several types of layout and mentioned the value of a precleaning room. His talk was illustrated with slides showing several plant layouts.

R. F. Ledford, a field engineer from the Chicago office of the Hanson-Van Winkle-Munning Company, discussed "Wearing Characteristics of Some Common Electrodeposited Metals." This talk was most timely in view of the increased attention now being given to deposition of various metals for building up worn parts or for protecting manufactured parts against wear. Mr. Ledford discussed the wearing characteristics of chromium, nickel, copper, and iron in several applications, but pointed out that information in the literature regarding the wearing qualities of nickel, copper, and iron was limited. He discussed a study of the effect of contaminants in the various solutions on the resistance of the resulting plating to wear. Also studied were the effects of addition agents used normally in the solutions mentioned.

The talk was illustrated by slides showing results of wear tests. The data obtained were secured through the use of a wear test machine developed by the Curtis Publishing Company to test wear and corrosion of printing plates. It was interesting to note that some addition agents and contaminants had little effect on the wear characteristics of the deposited metal while others had a marked effect.

Dr. Charles L. Faust, head of electrochemical engineering research at Battelle Memorial Institute, and president of The



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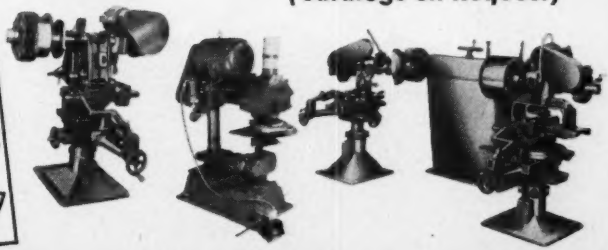

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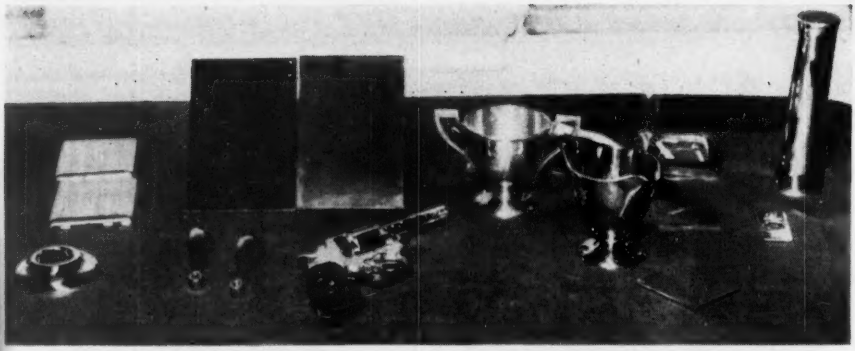

Fig. 1—In this photograph may be seen some of the examples used by Dr. Faust to illustrate his talk on "Alloy Plating". The die-cast automobile window handles shown in the foreground illustrate the ability of Bright Speculum to match the appearance of bright nickel and chromium, since one handle was finished with the former combination and the other handle with the latter. One piece of the sugar and cream set shown was silver plated in the conventional manner, and the other was finished with a Bright Speculum deposit. The article finished in Bright Speculum was almost identical in appearance with that finished with silver. The two panels in the background illustrate the improved leveling effect exhibited by Bright Speculum as compared with bright nickel. Also shown in the photograph are examples of Bright Speculum deposited over brass on various objects.

Electrochemical Society, discussed "Alloy Plating," pointing out that research work has been conducted on alloy deposition in order to secure properties of the deposit which were not obtainable in a single metal plate. Applications for alloy plating include bearings and many commercial and household items requiring decorative and protective finishes.

Bearing alloys of lead-copper-tin, silver-tin, and silver-cadmium were discussed. Alloys for protective coatings in which appearance is not important include tin-zinc, copper-tin, cobalt-tungsten, and alloys of chromium with various metals, and tungsten with various metals. A silver-lead alloy plate has been developed which resists the corrosive action

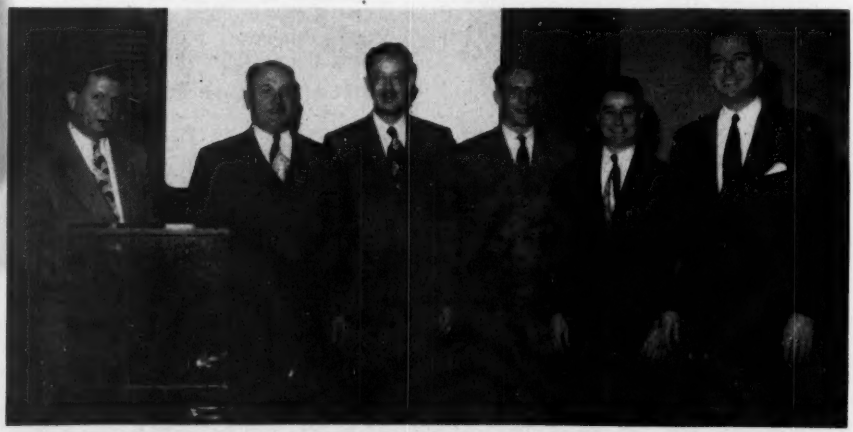

Fig. 2 (left to right)—W. J. Neill, A.E.S. Supreme President; S. M. Martin, United Chromium, Inc.; Dr. Charles L. Faust, Battelle Memorial Institute; Gordon R. Lyons, librarian, Dayton Branch; E. W. Rehme, president, Dayton Branch; Ray F. Ledford, Hanson-Van Winkle-Munning Company. (*Photos by PRODUCTS FINISHING*)

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A remarkable new additive that speeds the action of your paint stripper.

KLEM Strip-Aid gives you more complete and cleaner stripping — Salvages paint rejects that have previously been too costly to handle or impossible to strip. Cuts stripping time in half.

Especially effective for removing accumulated paint from handling equipment.

of some engine oils so that the lead-indium coating developed to protect against oil corrosion need not be used.

A cobalt-nickel alloy has found application as a magnetic coating on copper wire.

Dr. Faust discussed a tin-copper alloy, designated as Bright Speculum, which has the appearance of silver and will not tarnish. The alloy has a leveling effect when compared with bright nickel and has withstood humidity cabinet exposure for 40 days without any change in appearance.

Also discussed was the 80/20 tin/zinc alloy which has been developed as a substitute for cadmium for corrosion-resistant applications. It protects the underlying steel better than zinc and solders better than tin or zinc. (See also "Some Practical Notes on Tin/Zinc Alloy Plating for Ferrous Components," PRODUCTS FINISHING, January 1951, Page 22, in which the tin/zinc alloy is discussed at length.) Several of the alloy plates discussed may be seen in Figure 1.

Elmer W. Rehme, president of the Dayton Branch, opened the subject of recent government orders limiting the use of various metals, and a short discussion on this subject was held with President W. J. Neill, H. D. McLeese, vice president, United Chromium, Inc., E. W. Bruck, past president, Indianapolis Branch, and others participating in the discussion.

The Indianapolis, Columbus, and Cincinnati Branches were all well represented at the meeting so that the affair assumed the character of a regional meeting. In addition, Society members from Chicago, New York, Detroit, Marion, Ohio, and Grand Rapids, Michigan, were also present.

The banquet and entertainment program which followed the educational session was well attended as usual, making the meeting a success in every sense of the word. Shown in Fig. 2 are the speakers and some of the Dayton Branch officers.

meetings

OF INTEREST TO FINISHERS

Apr. 14. Annual Ladies' Night Banquet and Dance, Pittsburgh Branch, A.E.S., Hotel Sheraton Ballroom, Pittsburgh, Pennsylvania.

Apr. 21. Spring Banquet, St. Louis Branch, A.E.S., Starlight Roof, Hotel Chase, St. Louis, Missouri.

Apr. 25-26. Seventh Annual Meeting of the Metal Powder Association and Metal Powder Show, Hotel Cleveland, Cleveland, Ohio.

Apr. 28. Annual Meeting and Banquet, Milwaukee Branch, A.E.S., Schroeder Hotel, Milwaukee, Wisconsin.

Apr. 28. 12th Annual New England Regional Meeting, A.E.S., Hotel Taft, New Haven, Connecticut.

Apr. 28. Annual Educational Session and Dinner Dance, Indianapolis Branch, A.E.S., Indianapolis Athletic Club, Indianapolis, Indiana.

Apr. 30-May 4. Fourth National Materials Handling Exposition, Materials Handling Institute, International Amphitheatre, Chicago, Illinois.

May 23-24. Fifth National Convention, The American Society for Quality Control, Inc., Public Auditorium, Cleveland, Ohio.

June 4-6. Nineteenth Annual Convention and Exhibit, Institute of Cooking and Heating Appliance Manufacturers, Netherland Plaza Hotel, Cincinnati, Ohio.

June 18-22. Annual Meeting, American Society for Testing Materials, Atlantic City, New Jersey.

July 30-Aug. 2. 38th Annual Convention, American Electroplaters' Society, Statler Hotel, Buffalo, New York.

Oct. 29-31. 63rd Annual Convention, National Paint, Varnish and Lacquer Association, Chalfonte-Haddon Hall, Atlantic City, New Jersey.

Nov. 1-3. 29th Annual Meeting, Federation of Paint and Varnish Production Clubs, Chalfonte-Haddon Hall, Atlantic City, New Jersey.

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it's the SHAPE that counts!

Butts, hinges and other builders' hardware essential to housing and the nation's defense program, are burnished smooth by Abbott Cones . . . shaped for better burnishing of flat surfaces joined to curved or cylindrical sections. Abbott Burnishing Shapes — Ball, Ovalball, Cone, Diagonal, Pin — make effective contact on metal stampings or castings of any size and shape. Each is a burnishing tool made from Abbott's high quality bearing ball steel, deep hardened and polished to a mirrorlike, glass hard finish. For *quality* barrel burnishing . . . use Abbott.

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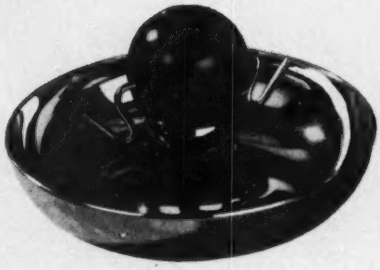
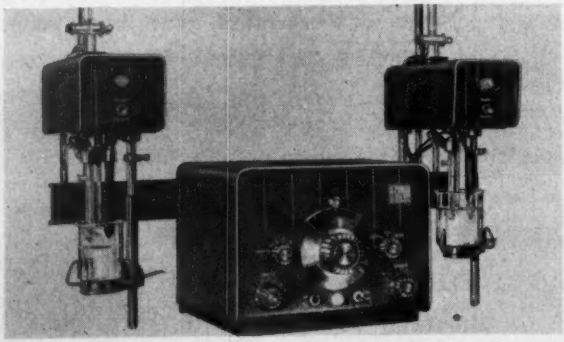


The modern ashtray here illustrated is composed of a bowl, finished in bright chromium plate, topped with a small ball of Bakelite phenolic plastic, into which holes have been formed to be used in snuffing out cigarettes. Small chromium plated hooks on the side of the ball hold lighted cigarettes.

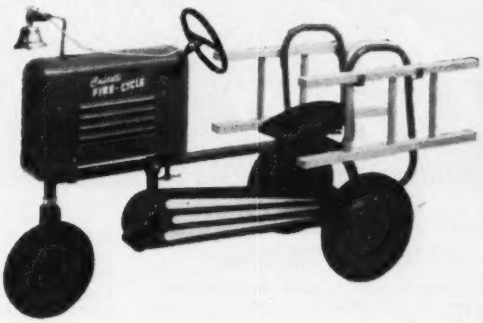
(Photo courtesy Bakelite Div., Union Carbide and Carbon Corp., New York 17, N. Y.)

The Beckman Automatic Titrator Case is finished with baked lacquer in two-tone gray. The aluminum base metal is exposed at edges and to form panel markings. All other external parts are brightly buffed stainless steel, completing the instrument's attractive, chemically-resistant finish.

(Photo courtesy Beckman Instruments, Inc., South Pasadena, Calif.)

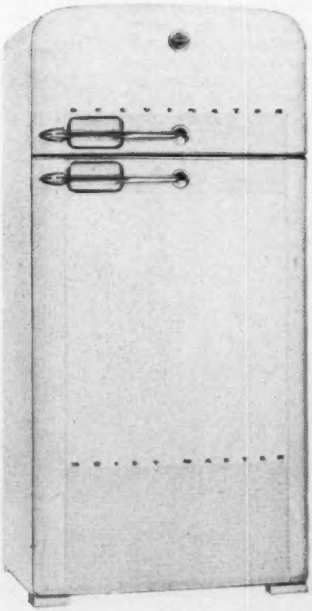


that aid in appearance and utility



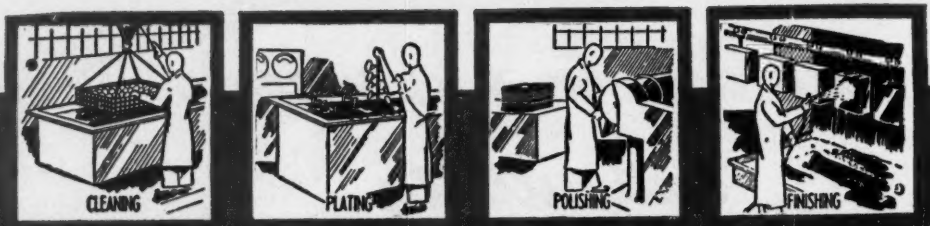
The "Fire Cycle," a late addition to the Castelli toy line, is finished in a single coat of red Randolph Fast Baking Durable S. G. Enamel.

(Photo courtesy F. C. Castelli Co., Philadelphia 34 Pa.)



Kelvinator's Combination Refrigerator-Freezer, with a separate freezer compartment across the top, is finished in durable "Permalux", a urea-formaldehyde modified alkyd enamel, baked 30 minutes at 300 deg. F. For extra resistance to food acids, the bottom interior is coated with high quality vitreous enamel.

(Photo courtesy Kelvinator Div., Nash-Kelvinator Corp., Detroit 32, Mich.)



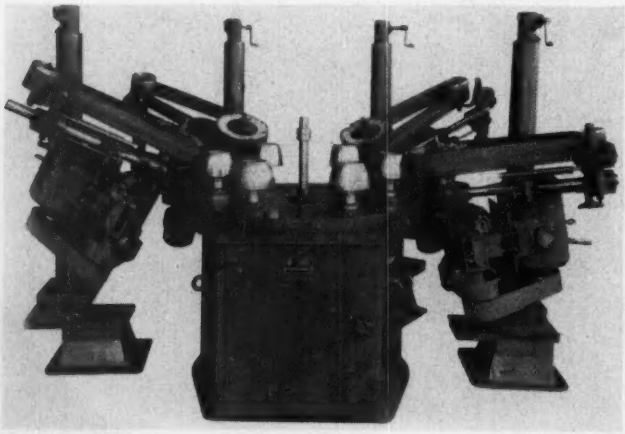
New • EQUIPMENT • MATERIALS • PROCESSES

Rotary Automatic Polishing and Buffing Machine

A polishing belt arm attachment which is universally adjustable from horizontal to vertical positions has proved effective in the 40-inch Rotary Automatic Polishing and Buffing Machine, developed by the Acme Manufacturing Co., 1645 Howard St., Detroit 16, Michigan.

The machine shown is a six-station indexing rotary with four Acme Type G-1 adjustable floating head buffing lathes equipped with the polishing belt arm attachment. It is used for polishing automotive grille parts. With this attachment the Acme G-1 and G-3 lathes are readily converted to polishing belt heads, the company states.

The machine has a one-second indexing interval, the same as all Acme indexing rotaries, and can be furnished with other features, such as geared chucks, oscillating arms, automatic locking tail stocks, vacuum chucking, and special fixtures. Stroking spindle arrangement for long belt life, vertical power traverse, reciprocative actions, and air lift can also be provided.



Acme 40-Inch Rotary Automatic Polishing and Buffing Machine equipped with a polishing belt arm attachment

"Britelume" Synthetic Enamel

Metal parts can now be coated with a special synthetic enamel that produces a finish closely resembling chromium, according to Maas & Waldstein Co., 438 Riverside Ave., Newark 4, New Jersey.

The finish, latest in the M & W line of Britelume coatings, may be applied directly over zinc or steel by spraying and may be air-dried or baked.

Pur-Blac Process for Blackening Steel

The Purico Pur-Blac Process for coloring steel, featuring a low-temperature black bath, has been announced by The Puritan Manufacturing Co., 29 Benedict St., Waterbury 65, Connecticut.

The process of producing a black finish on steel involves the following steps:

1. Clean the parts thoroughly in an alkaline cleaner.
2. Rinse in hot water at 180 deg. F.
3. Immerse articles to be blackened for 5-15 minutes in a solution containing 8½ pounds of Pur-Black Blackening Salts per gallon of water, maintained at 285-295 deg. F.
4. Rinse in cold water.
5. Dip for 5 minutes into Purico Soluble "O" Oil, maintained at 180-210 deg. F.
6. Drain and dry in sawdust or by any other convenient means.

Harshaw Fluoborate Plating Chemicals

With the decline of decorative plating and the increased use of protective metallic coatings such as lead and tin, Harshaw Chemical Co., 1945 E. 97th St., Cleveland 6, Ohio, has announced its line of fluoborates.

Lead, because it is one of the few common metals without use restrictions, is being used to replace zinc and cadmium electrodeposits in many instances. Although the use of tin is restricted, it may be applied to some food containers and processing equipment, as well as electrotypes and various articles as permitted by N.P.A. Regulations. Alloy deposits of lead and tin have been used to prepare bearing surfaces.

In addition to these metals, copper and cadmium fluoborate solutions are finding new applications, the Harshaw Company states. Deposits from cadmium fluoborate baths can be used on hardened steel parts with decidedly less hydrogen embrittlement.

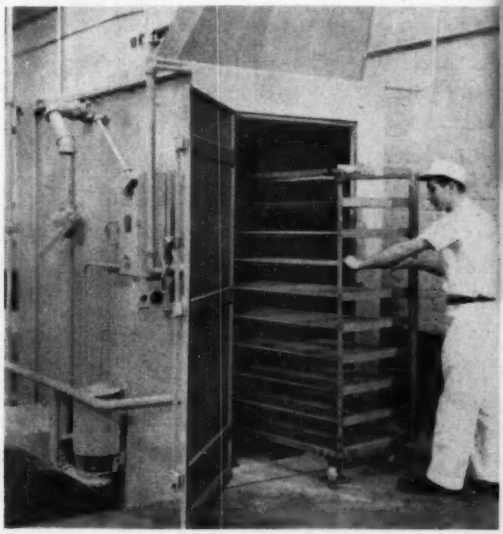
Characteristics of fluoborate baths are: ease of bath formulation, simple operation and control, stability, and a high operating efficiency.

Industrial Rack Washing Machine

The design and manufacture of a washing machine for sanitizing racks and the equipment on them has been announced by the Industrial Washing Machine Corp., New Brunswick, N. J. Designated as Model RW 36 X 82 W-F-R, the machine has a capacity of 15 racks per hour, which greatly accelerates the rack washing process and saves many man-hours of labor.

With this model a single operator merely loads the machine, sets the automatic timer button, and pushes the starter button. A signal light on the control panel goes out, indicating completion of the cleaning cycle. The operator then activates the rinse valve for several seconds and the rack is ready for use.

The washer can be heated by steam, gas, or electricity. Only 9 feet long x 6 feet 4 inches wide x 9 feet 6 inches high, the unit can be installed either in a pit or at floor level with a ramp supplied.



Industrial Rack Washing Machine

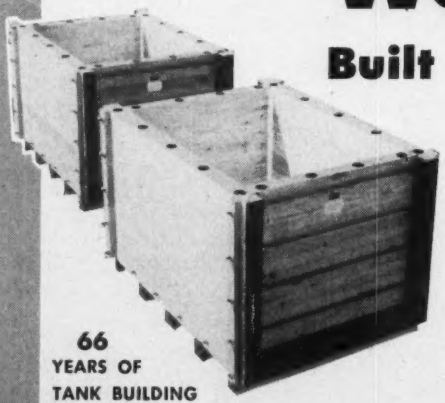
Electronic Accessory for Paint Spraying

Ashdee Products, Inc., 18029 Dixie Highway, Homewood, Ill., has announced an electronic accessory for paint spray units known as the "Paint-Miser."

According to the manufacturer, the unit operates on the electrostatic attraction principle which precipitates up to 95 per cent of the paint spray on the work, greatly reduces overspray, and cuts paint waste to a minimum. This is accomplished by establishing a negative charge in the paint particles as they leave the spray gun. The paint spray containing the negative charge is then attracted to the item to be coated which is at ground potential. With this method, spraying from one fixed position allows the paint spray to reach around corners, cover top, bottom and hard-to-get-at places with a smooth, uniform coating.

The manufacturer further states that the Paint-Miser provides better, more uniform surface coverage with no build-up on edges. Articles like cabinets, metal furniture, light fixtures, and other items, which ordinarily are difficult to coat, can be sprayed easily and quickly with practically no hand touch-up. The Paint-Miser adapts readily to any finishing department; extensive changes in spray booths, plant layout, or conveyors are not necessary. Operation is extremely simple, requires less manpower, less ventilation. The compact power supply unit is contained in a sturdy metal console cabinet with the control panel mounted on the top at a convenient operating angle.

Ashdee "Paint-Miser"



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WOOD TANKS

Built to Specifications

Plating and pickling tanks built to your specifications is a Kalamazoo specialty — any size or shape — fir, oak, cypress or redwood.

Tanks on left were made for large manufacturer of automobiles. They are 88" x 64" x 62" — made of 8" long-leaf yellow pine with B & M anti-acid metal tie rods.

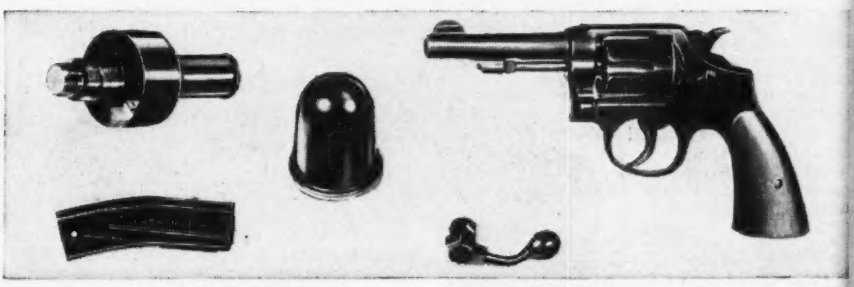
Write today for estimates and suggestions.

Kalamazoo TANK AND SILO COMPANY

428 HARRISON ST. • KALAMAZOO, MICH.

BLACK MAGIC

The PROVEN Finish
For Military and Civilian Items



Black Magic is a lustrous, permanent black for steel and iron. It meets military specifications for this type of black oxide finish. Not only an attractve finish but also a good bond for paints and lacquers. Black Magic is being used for many electroplated finishes affected by material shortages and restrictions. For fully automatic or hand operated tanks. Write for our complete catalog.

Items for civilian use with BLACK MAGIC finish.

MITCHELL-BRADFORD CHEMICAL COMPANY
MODERN METAL FINISHES
• 2446D MAIN ST., STRATFORD, CONN. •

BLACK-MAGIC OXIDE BLACKING SALTS
WITCH-DIP & WITCH-OIL FINAL FINISHES

SILCO *Glass-Base* PROTECTIVE COATING
HEAT TREATING SALTS. CLEANERS. ETC.

Easily portable, the unit has an overall size of 18 x 18 x 48 inches. Output is 0-100 p.k.v., d.c., 4 milliamperes maximum; input, 110/120 volts, 60 cycles, 500 watts.

Safety Carboy Tilter

A special safety carboy tilter which provides a safe and easy method of pouring acids from all size carboys is furnished by the Hanson-Van Winkle-Munning Co., Matawan, N. J. The cradle and supporting base are made of structural steel, and all members are riveted or welded to ensure strength and durability.

The tilter holds the carboy firmly in place by a clamping mechanism which is quickly operated by a positive screw action. The clamp is easily adjustable for large or small carboys. A safety ratchet control provides easy and steady tipping action, it is stated.

Clair Surface Finishing Machine

Both surfaces of either flat or contoured items may be finished to any degree, from flash removal to mirror finish, by the Model 202 Surface Finishing Machine, introduced by the Clair Manufacturing Co., Inc., 1010 S. Union St., Olean, N. Y. Designed to provide automatic float of buffs at any predetermined uniform pressure, the unit is claimed to be exceptionally versatile.

The machine is equipped with two spindles to accommodate rolls 40 inches in width and up to 9 inches in diameter. The automatic hydraulic "in" and "out" stroke is adjustable from ⅜ to 24 inches. A bar mounted across the front serves to open the rolls instantly, and arrest all actuation for loading or as an emergency measure.

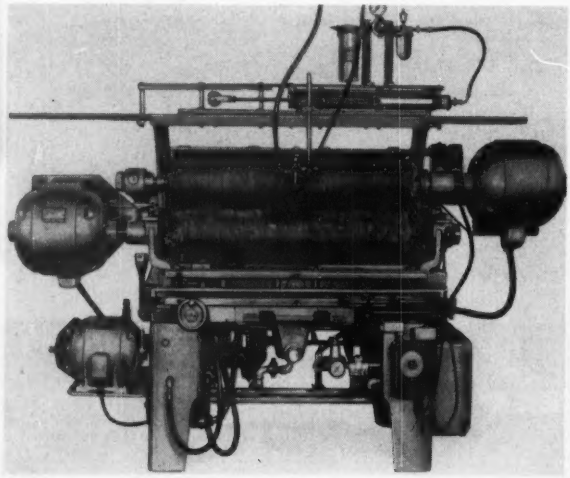
A wide variety of optional features includes choice of horsepower, variable speed controls, automatic cycling devices, and numerous other modifications.

U. S. Royalguard Protective Coating

Development of an air-drying plastic protective coating has been announced by the United States Rubber Co., Rockefeller Center, New York 20, N. Y. The coating is used to protect tanks, tank cars, pipes, fittings, structural steel parts, and chemical processing equipment against attack by splash, drip, and spray from corrosive chemicals, corrosive atmospheres, weathering, and rust. It is expected to find its broadest use in chemical processing, sewage disposal, filtering, and electroplating operations.

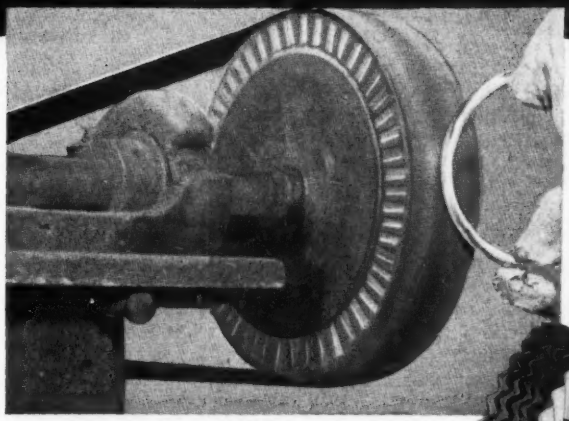
The plastic combines high film flexibility with good adhesion and impact resistance. It will not chip or crack and can be used on steel, aluminum, and other surfaces. It is applied by spray, allowing one-hour drying time between coats and 24 hours' drying time after the final coat. It requires no primer and can be produced in a variety of colors. Since it contains no chemical plasticizer to leach out or harden, it retains its flexibility throughout its service life.

A sharp instrument will cut through the film but the break can be repaired easily by "touching up" with brush or spray. Metal should be grit or sandblasted before the coating is applied.



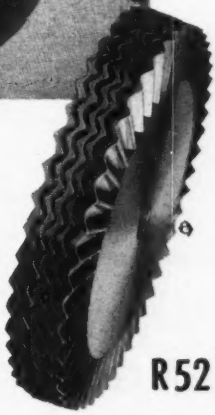
Clair Model 202 Surface Finishing Machine

Now on the job!



Wherever polishing or stock removing is done, the talk today is of the amazing new COSMO-WHEEL. For the word is going around that when the COSMO-WHEEL comes in; problems go out.

- * SMOOTHER POLISHING
- * FAST, EFFICIENT CUTTING ACTION
- * FAR LONGER BELT LIFE.
- * EASY ECONOMICAL REPLACEMENT



R52

R 51

Largely, this performance is due to the COSMOWHEEL'S exclusive short wave flexing action. This is the action that works the belt so as to constantly vary the angle at which the abrasive is presented to the work. This causes the almost unbelievable efficiency of this product, and makes it possible even to use discarded, loaded and glazed belts—and use them until all the abrasive is worn off. The COSMOWHEEL is made in a variety of hardnesses and sizes. It is factory-dressed to your operating speed.

You may obtain these wheels, or information about them, from the major abrasive companies or their distributors from coast to coast. Direct inquiry, is of course invited.

R51

CHICAGO RUBBER COMPANY, INC.

Main Office and Factory: 2620 N. Clybourn Ave., Chicago 14, Ill., Phone EAstgate 7-9050

SpeedWay No. 150 SpeedSander

SpeedWay Manufacturing Co., 1834 S. 52nd St., Cicero 50, Ill., is offering its No. 150 SpeedSander, which sands and polishes almost any surface. Action of the unit is orbital; 3,450 times a minute its 4 x 5-inch sandpaper covered pad describes a $\frac{3}{16}$-inch diameter orbit, driven by a direct-connected powerful a. c. induction motor. This absolutely uniform, continuous motion gives a correspondingly uniform cutting action to the abrasive (without reversing points, scratches, or grooving). Thus, the manufacturer states, the SpeedSander can sand or polish to a "piano finish," or feather edge, rub and polish without danger of burning or dulling the smoothest surface.

A hardy tool that handles coarse abrasives as readily as those of finer grit, the SpeedSander performs excellent work with aluminum oxide and silicon carbide abrasives for metal, or in wet sanding with waterproof paper or free abrasives.

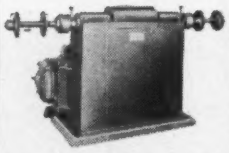
The unit contains a powerful motor which operates on sealed ball bearings and is direct connected to the sanding platen. There are no gears or grease-filled transmission to become fouled with grit and sandings. The entire base pad (4½ x 5-inch steel platen, faced with ¼-inch industrial sponge) rotates on four large Neoprene balls, a SpeedWay development which is said to assure quiet operation and uniform resiliency over the entire pad surface.

SpeedWay No. 150 SpeedSander

The aluminum housing has cast-in openings through which cooling air drawn through the motor is discharged horizontally around the sanding pad, keeping the working surface clear of abrasive grit and dust. The cast-on handle is formed to fit the hand, carries a heavy-duty thumb switch, and holds the 10-foot cord above the work.

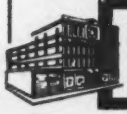
Weighing only 5 pounds, the Speed-Sander can be used one-handed even in overhead work. It has a front knob handle for two-handed use where pressure is desirable. This ball knob is instantly removable to permit working close into corners.

IS YOUR PROBLEM POLISHING?



HOLLAND SUGGESTS: Twin motor double spindle vee belt drive heavy duty buffing and polishing lathe. 3-15 H.P.

Contact our technical staff on your metal finishing problems. Write for FREE folder "M" showing our wide selection of metal finishing equipment.



J. HOLLAND & SONS, INC.
MANUFACTURERS • DEALERS
276 SOUTH NINTH ST. • BROOKLYN, N.Y.

Protective Ceramic Coating For Metals

A ceramic coating for metals and alloys that withstands oxidation, corrosion, flexing, vibration, percussion, and severe thermal shocks has been developed by Elraco Engineering Co., 158 Fourteenth Street, Hoboken, New Jersey.

The coating, known as "Elkote," provides a protective barrier against corrosion and oxidation at temperatures up to 2400 deg. F. It also withstands prolonged immersion in corrosive liquids, the manufacturer states. Elkote adheres firmly to metals of widely different coefficients of expansion, even when subjected to flexing, percussion, vibration, and sudden

HARSHAW

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COPPER FLUOBORATE

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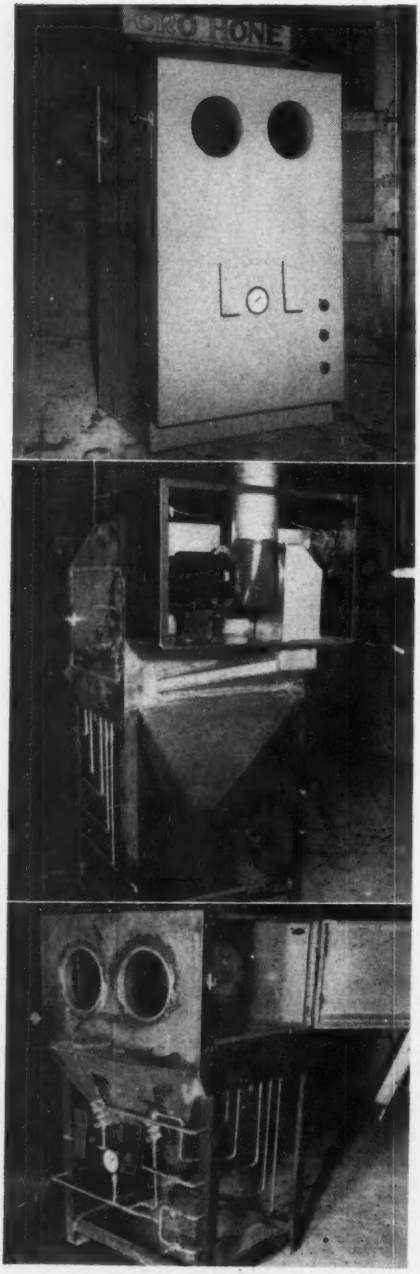


extreme temperature changes. To demonstrate its thermal shock-resistance, metals protected with Elkote have been heated to 1700 deg. F. and plunged suddenly into cold water.

Diversified Wet-Blasting Procedures Achieved with Cro-Hone

The technique of wet-blasting has, over the years, attained wide industrial acceptance for a variety of applications in the field of metal-working, but the complex, pump-fed equipment generally required for this method of surface finishing and preparation often limited its use. Today, the Cro-Hone and modification of the standard Cro-Hone are finding increased application and acceptance for fast, accurate stock or scale removal, deburring, removal of amorphous metal, preplating cleaning and surface activation, uniform non-directional finishing, improvement of oil-retentive surfaces, formation of contrasting decorative finishes, and many other functions.

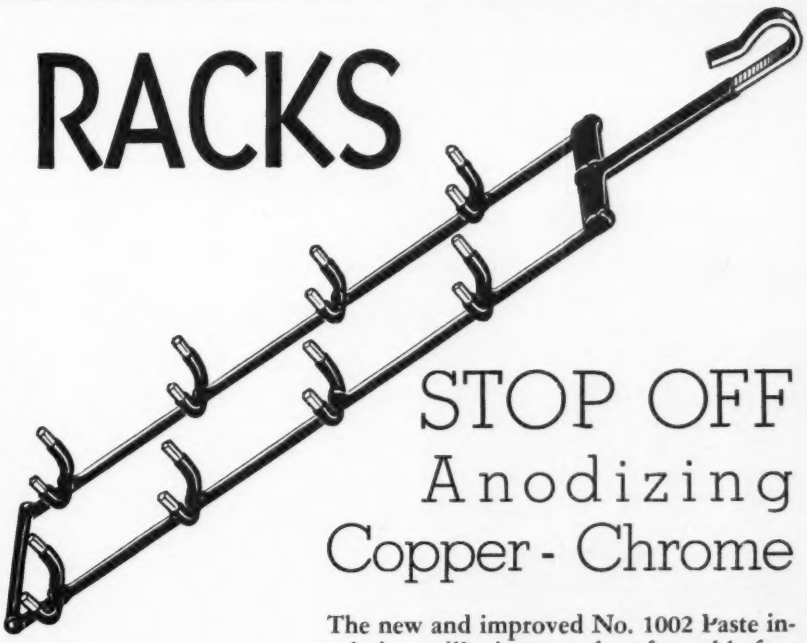
Designed, engineered, and manufactured by The Cro-Plate Co., Inc., Hartford 5, Conn., the Cro-Hone is small and compact and constructed of Type 304 stainless steel and copper tubing. There are no circulating pumps or moving parts; variations in air pressure at two different points within the structure of the siphon jet gun accomplish the pumping action required to raise the abrasive slurry.

For the accommodation of extremely heavy work, such as large dies or molds, the spacious 30 x 30-inch work table of the standard unit is located at the level of the work loading doors and is heavily stressed. Reinforcement of this operating platform greatly increases the use of the Cro-Hone in a variety of installations.

The actual process of installation is extremely simple. One ½-inch water connection and one ½-inch air connection are all that are needed for full operation. Blower outlets, and in some cases, drain settlement tanks, are often employed, but neither is necessary.

Fig. 1 (top)—The completed Cro-Hone, ready for installation.
Fig. 2 (center)—Standard Cro-Hone, unpainted, with skirt off, showing blower mechanism and arrangement.
Fig. 3 (bottom)—Standard Cro-Hone, unpainted and incomplete, showing copper plumbing and knee actuators.

RACKS



STOP OFF
Anodizing
Copper - Chrome

The new and improved No. 1002 Paste insulation will give months of trouble-free operation on racks for zinc, tin or cadmium plating or in aluminum anodizing.

BUNATOL No. 1002 is 100% solids so there is no loss from evaporation. Tremendous chemical resistance and extremely tough to stand wear and abuse. High gloss surface stops carry over from tank to tank. Requires only a single primer coat which really holds. So simple to use —complete job in under three hours. Quick service—low labor cost—time saved. Investigate!

We also make Stop Off lacquers. No. 474 Red does a great job in hard chrome. No. 608 Green for Copper. New No. 796-CC for aluminum anodizing or chemical treatments. All quick air drying and low in cost.

A note on your letterhead will bring complete information.

NELSON J. QUINN COMPANY TOLEDO 7, OHIO

— for 15 years —

Rack Insulation Exclusively

In operation, metal parts or tools to be finished are inserted into the cabinet through the front hand holes or side doors, as in the case of automatic operation. Both entrances are fitted with splashproof guards. All controls are located at the front of the cabinet, and a large, clear-view window enables the operator to watch.

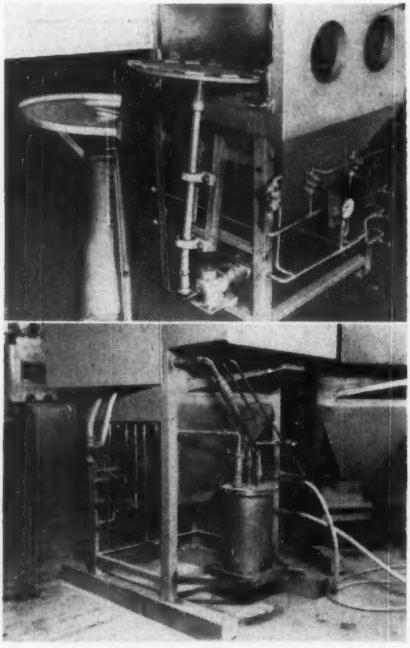


Fig. 4 (above)—Standard Cro-Hone with rotary work table attachment designed for Duncan Electric Manufacturing Company.

Fig. 5(below)—Standard Cro-Hone with pressurized attachment for high speed deburring, descaling, stock removal, and so on.

Specifications of the Cro-Hone are as follows: floor space, 30 x 36 inches; work table size, 30 x 30 inches; head room, 5 feet 2 inches; approximate weight, 550 pounds; blower size, 600 c.f.m.; slurry capacity, 35 gallons; power requirements, 110-volt, single-phase, 60 cycle, 3 amp. for blower and lighting; air requirements, 40 c.f.m. at 60-90 pounds per square inch. The accompanying photographs stress various features of the Cro-Hone.

Barrel Finishing Compounds

Almco Supersheen of Albert Lea, Minn., has announced the development of the following three barrel finishing compounds:

Almco Supersheen Abrasive Compound No. 3, a replacement for the "emery and oil" method of tumbling, contains a very aggressive abrasive and can be used with water. Advantages claimed include fast cutting down, free rinsing, oxidation inhibition, improved color, and rust prevention. Recommended for use in self-tumbling and also with the various abrasive chips, it speeds up the grinding operation and provides excellent surfaces for the adherence of paints or coatings.

Almco Supersheen Coloring and Burnishing Compound No. 10 prevents discoloration of work due to compound breakdown. It produces a clean, free-rinsing surface with no fatty soap deposits which might interfere with subsequent electroplating operations. According to the manufacturer, No. 10 Compound contains ample water softeners, requiring no separate additives under hard water conditions, and prevents "loading" of chips or work with hard water precipitates or soil. A special advantage cited for the burnishing compound is that aluminum and stainless steel colors are protected during deburring and grinding cycles.

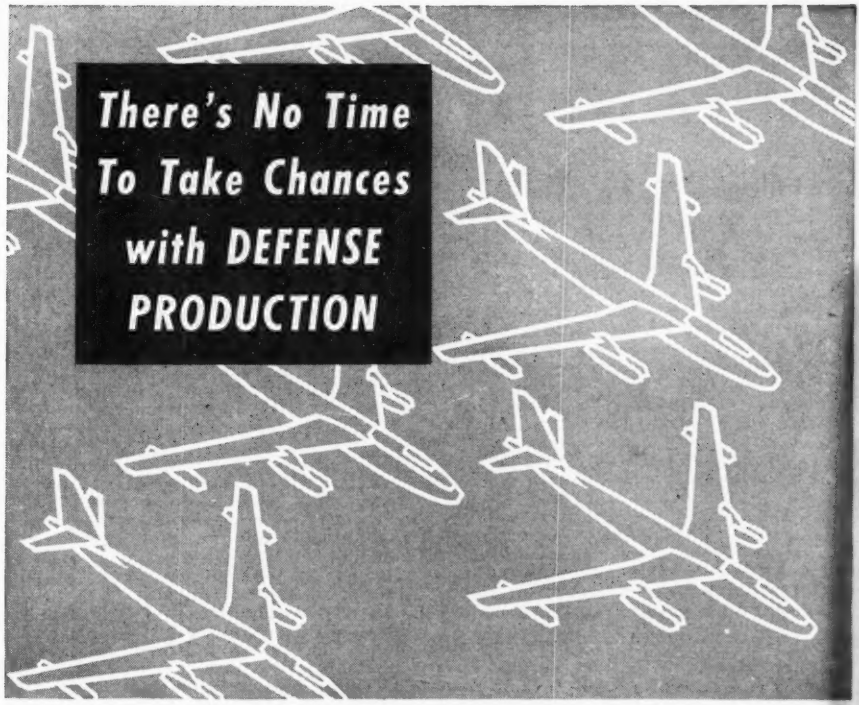
Designed especially for applications requiring quick descaling of steel parts is Almco Supersheen Descaling Compound No. 15. Slightly acid, it descales, deburs, and polishes simultaneously when used in combination with abrasive chips, Effective with either cold or hot water, No. 15 Compound is claimed to leave the work and chips clean and ready for grinding, burnishing, or coloring operations.

Industrial Wax W-6119

A non-toxic corrosion inhibitant to meet government specifications on the manufacture of food handling equipment has been developed by S. C. Johnson and Son, Inc., Racine, Wis. Identified as Industrial Wax W-6119, the corrosion preventative was especially formulated by Johnson chemists to meet Defense Department Specification Mil-C-10382.

The material gives the needed protection to many types of food handling equipment, including utensils, stoves, refrigerators, immersion heaters, baking ovens, and so on.

It can be applied by conventional dips,



Steel Parts Finishing, a vital requirement in defense production, must be handled with proven processes, methods, and materials. Don't take chances that may hamper production efforts.

DU-LITE Black Oxide STEEL FINISH has long demonstrated its superior qualities — its uniformity — its aid to lubrication when applied to engine bearings. Furthermore it is economical, and backed by Du-Lite's guarantee of results.

Leading manufacturers throughout the country, producing vehicle, aircraft, tank and marine engines, arms, bomb parts, instruments, tools, and machine parts, are using Du-Lite. If you want your product to measure up to the most rigid specifications use DU-LITE Black Oxide STEEL FINISH.

THE DU-LITE CHEMICAL CORPORATION

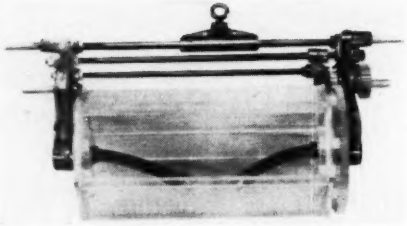
100 RIVER ROAD • MIDDLETOWN • CONN.

spray or brush methods to all types of metals. When removal is necessary, a standard vapor degreasing operation is used.

Plexiglas Plating Cylinder

The Hanson-Van Winkle-Munning Co., Matawan, N. J., has announced the development of a plexiglas cylinder for barrel plating. The illustration shows a 14 x 30 inch O.D. cylinder with rubber-covered hanger arms and flexible dangler contacts. Hair pin type dangler contacts or disc contacts can also be supplied.

Plexiglas is suitable for either cyanide or acid solutions, and can be carried through the entire cleaning, pickling, and plating cycle. Where cyanide solution is involved, the cylinders are equipped with 90-tooth cast iron gears with both hangers of cast iron. Cast iron hangers are recommended for cadmium, cyanide copper, BBZ-200 Zinc, or any other alkaline or cyanide bath. Where the cylinder is used in an acid solution such as nickel, or carried through the entire cleaning and pickling cycle, 90-tooth Merlon or Plexiglas gears are supplied and the hanger



Mercil Type Plexiglas Cylinder with hanger equipment and flexible dangler contacts

arms are of cast iron, rubber-covered.

Only high temperature Plexiglas, satisfactory for temperatures of 185 deg. F., is used, and the cylinder is guaranteed to stand up under these conditions.

The hanger arm construction represents a great improvement especially on the rubber covered arms. The rubber is durable and the trunion holes are rubber lined, thus completely insulating the arms. Merlon trunions are pressed into the hanger. When the trunion needs to be replaced, all that is necessary is to press out the old trunion and insert the new one.

In the construction of Plexiglas cylinders, heat is applied to join the parts properly. The heads are 1 inch thick; panels ½ inch thick. The cylinders are hexagonal in shape with the inside ribs and cover held in place with the "C" type clamp. Plexiglas cylinders can be repaired by the application of heat.

All parts are molded and are cemented together with Plexiglas cement. The five cylinder panels are "V" shaped horizontally through the middle which not only strengthens the cylinder, but provides better tumbling action, as the point of the "V" is on the inside of the cylinder. With this construction, better tumbling action is secured and there is no danger of work sliding on the panels, the company states.

FORM-A-ROC
FIRST-COAT
FOUNDATION
FOR FINE FINISH

1. Dries with lacquer speed.
2. Has double lacquer solids at spray gun.
3. Fills very well—sands easily.
4. Adheres tenaciously to steel, wood, presdwood, aluminum, galvanized metal, etc.
5. Holds out lacquer, synthetic or oleo-resinous enamels exceptionally well.
6. Thins 3:1 with xylol.
7. Available in GREY, SALMON and OFF-WHITE.
8. Ground well to smooth texture.

MADE BY
The Varnish Products Company
5208 Harvard Avenue Cleveland, Ohio

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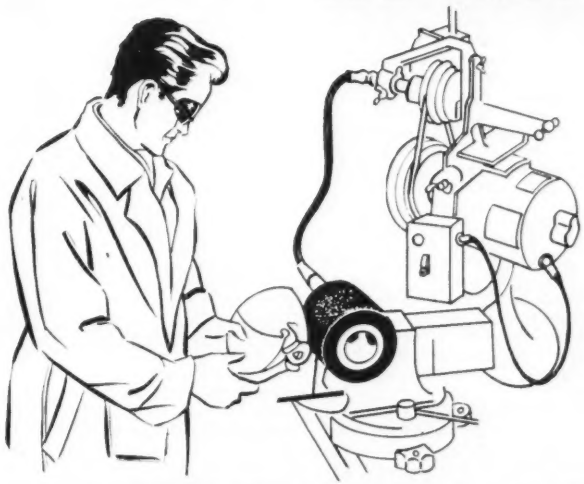
THE LOFGREN PROCESS

We RECOVER YOUR
SOLVENTS and THINNERS
From - Wash Thinners, Spoiled Lacquers, Degreasing Machine Sludge, Etc.
Each customer's shipment, whether one drum or a carload, receives proper and separate treatment. Write to:
SOLVENTS RECOVERY SERVICE, INC.
101 Central Ave. or Westfield, N. J.
HAMMOND SOLVENTS RECOVERY SERVICE
241 Brunswick St. Hammond, Ind.

NEW, IMPROVED **NU-MATIC**



THE WHEEL WITH THE PNEUMATIC DRUM

With this Nu-Matic wheel the abrasive belt rides on a cushion of air contained in a rubber drum. Different pressures in the drum and different grits provide varied surface finishes. Deflate, and belts can be changed easily and quickly for grinding, sanding or polishing. Cut your labor, production and inventory costs with Nu-Matic grinding units. Adapters for 5/8"-11 or 1/2"-13 power equipment. (Specify size.)

Adaptable to bench, portable or flexible shaft power.

NU-MATIC GRINDERS, INC., 10304 W. McNICHOLS RD.
Detroit 21, Michigan UNiversity 3-2573

Pre-Finish Metal Cleaner

A special acid phosphate cleaner developed for the preparation of metal surfaces for painting, lacquering, or japanning has been added to its line of metal cleaners by E. F. Houghton & Co., Philadelphia 33, Pennsylvania.

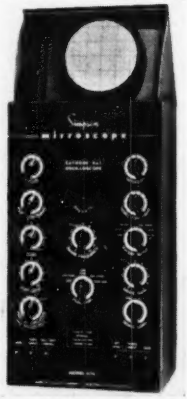
Designated as Houghto-Clean 313-A, the cleaner conditions metal for final finishing by removing soil, such as processing oils and compounds, rust preventives, perspiration, and soldering residues, and then deposits a smooth, dry coating of phosphate on the metal surface to provide greater adhesion of the finishing material. Action is fast, thorough, and reliable, allowing for speedy production and a more durable finish, the manufacturer states.

In addition to preparing the surface, Houghto-Clean is claimed to protect against rust. Parts cleaned but not painted immediately will not corrode. Should the paint become scratched after application, the protective phosphate film resists rust and prevents it from spreading beneath the paint.

Simple to use, the cleaner mixes easily with water, needs no rinse in most cases, and requires no special equipment. It can be used in still tanks or power washers.

Space-Saving Oscilloscope

Simpson Electric Co., 5200 W. Kinzie, Chicago 44, Ill., is producing an oscilloscope designated as the Model 476 Mirroscope. By use of the Mirroscope principle, the 5-inch cathode ray tube is mounted in a vertical position, thus reducing bench requirements to an area of only 9 x 8 inches.



Model 476 Microscope

The cathode ray image is reflected from a high grade mirror mounted in the adjustable cover at the top of the cabinet. Thus, the viewing surface is brought near eye level when the instrument is used on a bench of normal height. Mirror and wing sides at the top, for deflecting light, fold into the cabinet when not in use. The unit is 16¼ inches high x 9⅛ inches wide.

PARAMOUNT BRAND

BOBS

ideal for burring

History is beginning to repeat itself. In connection with the past great war production program of American Industry, burr removal by felt bobs and wheels was a major item. For many operators this flexible method was the only way to remove burrs and yet hold to tolerances.

We have many types of felt bobs — both plain and mandrel mounted; also a large assortment of felt wheels. Or we can shape bobs and wheels to fit your requirements. Whatever size or shape, you will find Paramount Brand Felt Bobs or Wheels to be quality production tools.

BACON FELT COMPANY

ESTABLISHED 1825

WINCHESTER MASSACHUSETTS

Your Supply House Can Furnish Bacon PARAMOUNT BRAND FELT BOBS & WHEELS

pH Papers

The Udylite Corp., Detroit 11, Mich., has available pH papers in the following four ranges: No. 701—pH 11.0-13.1; No. 4832—pH 4.8-6.2; No. 3650—pH 3.6-5.0; and No. 2439—pH 2.4-3.9.

All the papers are said to be very accurate in comparison with electrometric values.

GOLD PLATING SOLUTIONS

In All Colors

Guaranteed 100% Pure Gold Content
Troy Weight - Color Constant
Tarnish Resistant
Proven Quality by the Acid Test
Write or call our experts about your plating problems

Davis-K-Products Co.

54 West 22nd St., New York 10, N. Y.
Oregon 5-0094
5-0095

Start Clean . . .
Stay Clean!

With the Strong Arm of the Law handy, no smart gal will risk all the time and money she put into getting slicked up. With Red Label Darco S-51 available, no smart plater will risk all the labor and expense of cleaning work for plating by putting the metal into a bath of questionable purity.

Start clean . . . *stay* clean! Red Label Darco S-51 adsorbs in its pores the impurities that cause trouble in plating baths . . . takes them out of the bath before they can be deposited on the freshly cleaned surface of your work.

Red Label Darco helps you save on scarce anode metals . . . helps you do a better job with thinner deposits and minimize rejects.

With clean metal . . . keep the Bath Clean

Red Label Darco S-51 is especially treated for use in plating—the only carbon that meets the benzol-mercury test! It is especially easy to handle . . . easy to wet . . . easy to make into a slurry. Place your order for Red Label Darco S-51 today. Practically all suppliers carry Darco in stock, so don't accept substitutes.

DARCO DEPARTMENT
ATLAS POWDER COMPANY

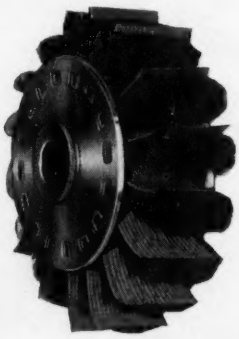
Darco General Sales Offices

60 East 42nd Street, New York 17, N. Y.

Portable Brush-Backed Polishing Head

A portable brush-backed polishing head has been developed by the Vonnegut Moulder Corp., 1819 Madison Ave., Indianapolis 25, Ind. The head consists of two principal parts: an outer shell or drum, holding sixteen replaceable brushes, and a center spool on which are coiled sixteen strips of abrasive cloth. In operation, the brush bristles force the abrasive tips into depressions and also allow them to ride over projections of the workpiece surfaces. This ability to follow irregular surfaces instead of reshaping them makes the head ideal for finishing operations on all shaped surfaces.

Since an entirely different set of results may be obtained with the same head, simply by changing the grade and grit of abrasive strips used, its applications are numerous. The more common uses are: removing bubbles and other defects from paint and enamel finish coats; feathering-out operations; removing rust, scale, and for other clean-up operations; removing the glaze and roughing the surfaces of molded mechanical rubber goods in preparation for subsequent processes; polishing out die marks on formed metal parts; smoothing die castings. Also, when size and shape permit, the head is ideal for removing burrs and polishing surfaces



Vonnegut Portable Brush-Backed Polishing Head

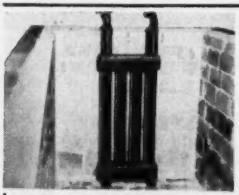
of the dies and molds which are used for making such parts; removing burrs from perforated stampings and fabricated wire products; wiping out discoloration and scratch marks resulting from grinding down weld beads and after other grinding operations; blending such areas with surrounding surfaces; polishing all kinds of ferrous and non-ferrous surfaces in preparation for buffing operations; satin finishes on flat and on irregularly formed surfaces.

The two end plates and central cylinder of the portable head are made of aluminum for weight reduction.

Made in 4 and 2-inch widths, the 4-inch width (for 4-inch abrasive) weighs less than 6 pounds when fully loaded. The 2-inch nominal width head (for 2-inch wide abrasive strips) weighs less than 4 pounds with a full load of abrasive, and is designed for use with portable power hand tools or on a flexible shaft. Both the 4

Park No. 290 BLACKENING SALT

Black Oxide finishing for rust resistance and decorative parts. Speedy black coating in water solution with no electric current. Permanent black finish on ordnance parts, tools, aircraft, bearing races. Dazzling black decorative finish for television cameras, business machines, hardware, metal screens and machine parts. Excellent bond for paints and enamels. Simple one bath operation. Write for bulletin H-16. Park Chemical Co., 8074 Military Ave., Detroit 4, Mich.



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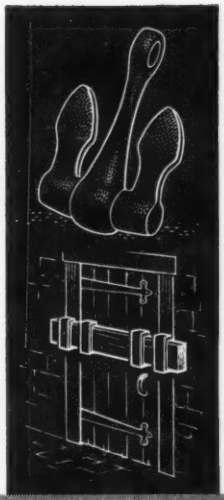
• Acid-Proof HEATING UNITS

Impervious Graphite Heating Unit

"Investigate Our Complete Facilities"

HEIL PROCESS EQUIP. CORP.
12901 Elmwood Ave., Cleve'd 11, O.

An anchor



for paint . . .

a bar against rust . . .

BONDERITE *belongs*

under the finish of fine painted metal products

The enemies of paint begin to work as soon as your product leaves your plant. Moisture, abrasion, scratches and dents injure the paint film and lay the metal bare. The finish on untreated metal will quickly deteriorate.

On Bonderite-treated metal the paint is anchored by the crystalline phosphate coating, integral with the metal. Because it's non-metallic, Bonderite resists rust and corrosion, confines finish damage from scratches to the injury itself. Bonderite-treated products *look better longer.*

Bonderite is the *standard* corrosion resistant paint base. It's used on thousands of painted metal products. Learn how it can help make *your* product better. Write today.

PROTECTED BY Bonderite QUALITY CORROSION RESISTANT

Bonderite, Parco, Parco Lubrite—Reg. U. S. Pat. Off.

PARKER

PARKER RUST PROOF COMPANY
2172 East Milwaukee Ave.
Detroit 11, Michigan

BONDERITE—Corrosion Resistant Paint Base • PARCO COMPOUND—Rust Resistant • PARCO LUBRITE—Wear Resistant for Friction Surfaces

and 2-inch models, while light in weight, are rugged in construction.

The central cylinder of the head has 4 anchor pins for securing 4 abrasive assemblies—4 strands per assembly—making up the 16—strand loading. This cylinder is rotated in relation to the outer frame to coil the abrasive strips within the head and also to release new cutting surfaces, by reversing the direction of rotation, after abrasive ends have lost their cutting efficiency.

Each of the 16 strands of abrasive is about 18 inches long, allowing for storage of approximately 24 lineal feet of coated abrasive.

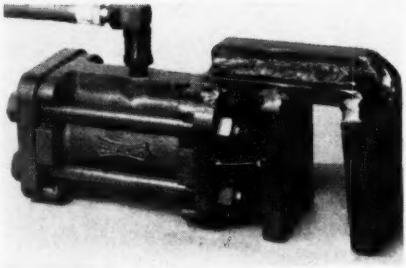
Silver Plating Addition

Enley Products, Inc., 254 Pearl St., New York 7, N. Y., is offering an addition agent for cyanide-silver plating solutions known as "Silver Speed." One gallon added to 200 gallons of present baths is said to produce adherent, high speed, soft, smooth, white, semi-bright deposits.

Used in any setup, in heavy production or with PR units, the baths are easily maintained and require no bath agitation.

Cleveland Vibrator

The Cleveland Vibrator Co., 2878 Clinton Ave., Cleveland 13, Ohio, has available a high frequency vibrator to use on the scoop when drossing a galvanizing tank. The vibrator is equipped with a hook to fit most scoop handles or the back of the drossing spoon. It is also available with the hook fabricated to meet customer specifications.



Cleveland Vibrator

Weighing 30 pounds, the unit is 12¾ inches long x 5¾ inches high x 4 inches wide; hook opening is 2 3/16 inches and hook depth, 4 inches. The vibrator is said to operate efficiently on 60 to 100 p.s.i. continuous line pressure.

Heat-Resistant Bake Enamel

A baking enamel for finishing metals that offers a high degree of heat resistance has been developed by the United Lacquer Manufacturing Corp., 1001 W. Elizabeth Ave., Linden 8, New Jersey.

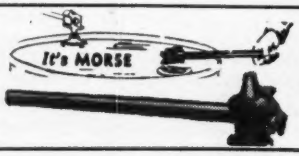
Originally developed to provide an attractive protective finish for ash trays, Base Y 2323 is expected to be used for a wide variety of other metal objects that are subjected to heat while in use, such as lamp shades, lamps, cigarette lighters, and gas ranges, it was explained.

Base Y 2323 adheres well to steel, aluminum, brass, chromium plate, gold, and silver.

In addition to its excellent heat resistance, it is non-yellowing and provides good chemical, solvent, and mar resistance. Applicable by the spray or dip process, it is available in all colors and in full gloss, semi-gloss, and flat finishes.

Learn about
"COPPER STRIPPING—
NON-DANGEROUSLY"
Wilfred A. McKeon
Sulphur Products Co.
Greensburg 8, Pa.

Send NOW for this FIT-ALL
DRUM PLUG WRENCH
Instantly loosens, tightens 95% all plugs or bungs in steel drums. Has 16" extra-strong steel tubing handle. Wgt. only 2 lbs. Order 1 or more today!



THOUSANDS IN USE saving time, labor, accidents!
SATISFACTION GUARANTEED.... $3.00
Non-sparking type $4.60
Plus Parcel Post
MORSE MFG. CO., Inc.
125 Dickerson, Syracuse 2, N.Y.

What gives the razor blade its smooth face?

...a brush!

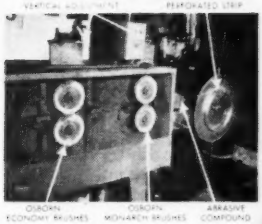
Here's a double-edge idea to improve your cleaning and finishing operations:

Now, after hardening razor blade strip, progressive manufacturers are (1) removing heat-treat scale and (2) preparing the strip surface for name-etching . . . *all in one speedy automatic brushing operation.* The continuous, hardened strip passes through a finishing compound, then between two counter-rotating Osborn Monarch® Brushes, then between two Osborn Economy® Brushes. These two Osborn brushing stations do the work of 6 stations of the former method. The strip comes out uniformly clean . . . micro-smooth.

Can you "double up" like this on cleaning and finishing? Or can you use new Osborn brushes and techniques in other ways to speed your output and cut costs? An **O**sborn **B**rushing **A**nalyst will gladly survey your plant and make suggestions. Call or write *The Osborn Manufacturing Company, Dept. 430, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

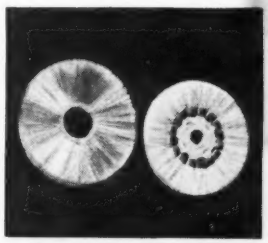
OSBORN

LOOK FOR THE NAME OSBORN . . . RECOGNIZED EVERYWHERE FOR QUALITY WORKMANSHIP AND MATERIALS



AUTOMATIC BRUSHING MACHINE *for cleaning and finishing hardened high-carbon steel razor blade strip. Brushes rotate at 3450 rpm, finishing strip for hundreds of thousands of blades per day.*

FINISHED STRIP *for double-edge razor blades. Manufacturer uses same type of equipment for single edge blades and cutting tool blades. Brushing removes heat-treat scale and prepares strip for etching.*



"DOUBLE-DUTY TEAM." *Left: Osborn Economy Brush. Right: Osborn Monarch Brush. The two brushing stations do the work of 6 stations of the former method.*

PRODUCT LITERATURE

For further information on any product mentioned in this issue—use the READER SERVICE CARDS between the covers.

"Prep" Specification Index, which lists government surface treatment specifications with the conforming "Prep" material noted opposite each particular specification, can be obtained from the Neilson Chemical Co., 6561 Benson St., Detroit 7, Michigan.

Industrial Vertical Leaf Pressure Filters for solution clarification are the subject of an eight-page, illustrated catalog issued by the Industrial Filter & Pump Manufacturing Co., 5904 Ogden Ave., Chicago 50, Ill. Construction and operation of Industrial's pressure filters are detailed, and complete information is given on the various standard models, types, and sizes for electroplating, electroforming, nickel dip, and neutralizer solutions.

Almco Supersheen Abrasive Media and Compounds. Almco Div., Queen Stove Works, Inc., Albert Lea, Minn., has available a 12-page catalog which discusses Supersheen Bonded Chip, Regular Chip, and Oxide Chip, and Supersheen Compounds Nos. 1, 2, 3, 10, 15, and 20. Also described and illustrated are various Almco finishing machines.

Chemical Resistant Construction. Heil Process Equipment Corp., 12901 Elmwood Ave., Cleveland 11, Ohio, has prepared an illustrated brochure which indicates its ability to build, assemble, or line chemical-proof equipment. Separate bulletins and complete data are presented on tanks and linings, tank heating units, dipping baskets, crates and carriers, chromium plating lead anodes, and specialties of the company.

YOU
can *rely* on
RANDOLPH
for prompt shipment
in any quantity of
Performance - Proved Government Specification
FINISHES
Lacquers • Enamels • Dopes • Thinners
Clear Metal Finishes • Clear S.G. for Metal • Colored Lacquers • Texture Enamels • Aircraft Finishes
Specialized Production Finishes
RANDOLPH PRODUCTS CO.
CARLSTADT, NEW JERSEY

Looking for a Better Finish?
Try
HARRISON'S
4A
TAILOR-MADE BUFFING & POLISHING COMPOUNDS
for
Aluminum, Brass, Copper, Stainless Steel, Carbon Steel, Etc.
EMERY CAKE, GREASE STICK
CEMENT AND THINNER
for setting up wheels, belts, and rolls
HARRISON & COMPANY, INC.
Haverhill, Massachusetts

you save 50% in TANK HEATING and COOLING with PLATECOIL

(REPLACE PIPE COILS)

★ You SAVE 50% in tank SPACE

★ You SAVE up to 50% in initial COST

★ You have 50% LESS WEIGHT to handle

★ You SAVE 50% in maintenance LABOR as plates are changed from outside the tank without dumping solution

. . . besides all these you get faster heating or cooling. Take advantage of the engineering assistance offered by Kold-Hold to help you with your heat transfer problems.

Send for complete technical manual and descriptive Bulletin No. P50.

PLATECOIL
Division
KOLD-HOLD MFG. CO.
LANSING 4, MICHIGAN

Why Platecoils Cost Less

LOW FIRST COST

The initial cost of Platecoil is often 50% or more below the cost of equivalent pipe coil depending, of course, on the materials used in construction.

EASY INSTALLATION

By the use of "quick change hangers" Platecoil installations can be made in open tanks in one-half hour or less by one man and a helper.

NO THREADED JOINTS IN TANK

The entire Platecoil is electric welded and pressure tested. There are no joints to corrode or leak. Both connections to the Platecoil can be located above the liquid level where there is no danger of thread corroding and freezing.

GREATER TANK CAPACITY

A 22" x 47" Platecoil gives the same heat transfer surface as 32 feet of 1½" pipe. This pipe requires a space approximately 30" x 60". Platecoil thus saves about 50% over equivalent pipe coil.

WEIGHS 50% LESS

Weighing only about half as much as equivalent pipe coil, Platecoil is easy to handle. A whole maintenance crew is not needed to transport and install Pipecoil.

TANK MAINTENANCE WITHOUT LOSS OF SOLUTION

There is no need for workmen to get inside the tank in order to make replacements or repairs. A Platecoil can be removed in a matter of minutes with the solution still in the tank.

LITERATURE

The new Platecoil Bulletin furnishes a complete description of the Platecoil method of tank heating. Write for your copy today.

HIGH BTU TRANSFER

More prime surface of Platecoil can be installed in a given area than can be obtained with pipe coil. Thus a more compact Platecoil unit provides much greater BTU transfer per unit area than can be obtained with pipe coil. Quick starts in heating tank solutions mean more hours of productive time.

Kold-Hold Manufacturing Company, Lansing 4, Michigan

Electric Grinders and Buffers. The complete line of Hisey electric grinders and buffers, products of The Hisey-Wolf Machine Co., Cincinnati 8, Ohio, is shown and described in **Catalog 71,** available from the company. Accessories and attachments are also described and illustrated.

Houghto-Clean 313-A, an acid phosphate cleaner developed for the preparation of metal surfaces for painting, lacquering, or japanning, is the subject of a Product Data Sheet issued by E. F. Houghton & Co., Philadelphia 33, Pa. Application and advantages of the cleaner are outlined.

Koch Finishing Equipment. Available from George Koch Sons, Inc., Evansville, Ind., is a 12-page two-color manual presenting its complete line of standardized and custom spraying, baking, washing, and conveying equipment, from the smallest to the largest unit.

Titeflex Industrial and Laboratory Filters. Data covering construction, operation, and features of its industrial and laboratory filters, together with illustrations of typical Titeflex installations, are contained in a 12-page two-color bulletin published by Titeflex, Inc., 500 Frelinghuysen Ave., Newark 5, New Jersey.

Floor Type Conveyors. Available by request on company letterhead is **Floor Type Catalog No. 51** prepared by Jervis B. Webb Co., 8951 Apine Ave., Detroit 4, Mich. Printed in two colors, it contains 90 pages of information on conveyor chains, Chain-On-Flat and Chain-On-Edge Floor Conveyors with a variety of pusher dogs used in connection with them; also, typical drive and takeup ends, sprocket and roller turns, cross sections, curves, inclines and declines which are used in these conveyor systems.

Illustrated **Dy-Chek Bulletin 500,** available from the Dy-Chek Co., Division of Northrop Aircraft, Inc., 1515 E. Broadway, Hawthorne, Calif., fully describes Dy-Chek, the dye penetrant method of metal inspection, and shows how this revolutionary chemical process simplifies non-destructive testing. Dip, brush, and spray methods are explained, and various applications in factories and in the field are discussed.

Gardner Gage, for measuring dry thickness of non-electrical conductive coatings and other sheet-like materials, product of Henry A. Gardner Laboratory, Inc., 4723 Elm St., Bethesda 14, Md., is fully described and illustrated in a six-page folder.

Unichrome Self-Regulating High Speed Chromium Bath. United Chromium, Inc., 100 E. 42nd St., New York 17, N. Y., has prepared a four-page two-color bulletin graphically describing its S. R. H. S. Chromium Bath, its features, operation, and advantages.

Manderscheid Polishing and Buffing Accessories and Equipment are the subject of **Bulletin 108,** prepared by The Manderscheid Co., 810 Fulton St., Chicago 7, Ill. Features of the equipment are described and illustrated in the six-page bulletin.

Protective and decorative coatings for all types of surfaces that have shown truly outstanding performances are described in a 28-page booklet offered by the Bakelite Co., Division of Union Carbide and Carbon Corp., Dept. 1503, 300 Madison Ave., New York 17, N. Y. Entitled **"The Story of Surface Coatings Based on Vinylite Resins,"** the booklet discusses the many essential applications of these surface coatings and is illustrated with a wide selection of photographs.

For a real good polishing job use

Keystone TURKISH Emery

FRESH SUPPLY AVAILABLE

KEYSTONE EMERY MILLS *Write for Sample* 4316 Paul St., Phila., Pa.

How to get Finer Finishes at Lower Costs

with GLOBE *Direct Motor Drive* TILTING TUMBLING BARRELS

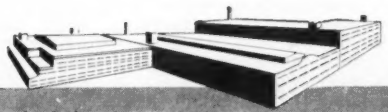
Available in Kiln-Dried Maple or Steel Shells

Process thousands of pieces at one time—faster, better and at lower cost—with Globe Precision Tumbling Barrels, dependable for 47 years. Globe's exclusive six-way work shifting motion cuts tumbling time and increases action. Speeds as low as 30 revolutions per minute assure finer finishes of non-ferrous metal parts. Motor is compactly mounted above the gear segment for space economy.

Free Experimental Service

Hupp's Experimental Engineering Laboratory can show you how to cut finishing costs. Just send samples of the parts to be processed along with a finished part. Write today! There's no charge or obligation.

Hupp Manufactures a Complete Line of Tumbling Barrels and De-Burring Machines.



HUPP CORPORATION

GLOBE STAMPING DIVISION

1250 WEST 76th STREET • CLEVELAND 2, OHIO

SERVING INDUSTRY SINCE 1902

Prepared especially for manufacturers of paints and enamels, an informative, 16-page technical service bulletin, **"Chlorowax 70 in Alkyd Enamel Systems,"** has been issued by the Diamond Alkali Co., 300 Union Commerce Bldg., Cleveland 14, Ohio. Available by request on company letterhead, the literature describes the use of Chlorowax 70, a chemically inert, nontoxic chlorinated paraffin resin, as a paint intermediate. Outlined are a number of typical systems for formulating air-dried and force-dried paint or enamel, which incorporate the material as a portion of the grinding base. Tabulation of the laboratory-evaluated specific properties provided by the twelve formulas used, in white, green, and red vehicles, completes the bulletin.

Protective Linings. Linings for steel drums and pails to protect a wide variety of products during shipment and temporary storage are described in a 12-page booklet entitled **"The Inside Story of Protective Linings for Steel Containers,"** issued by The Glidden Co., 11001 Madison Ave., Cleveland 2, Ohio.

The booklet describes protective linings manufactured by The Glidden Company for drums and pails for packaging animal and vegetable oils and fatty acids, products of oil refiners, strong solvents, food products, and miscellaneous products, including soaps, stains, water-thinned paints, resins, paint and varnish removers, formaldehyde, and sulfuric and other acids. The development of the linings through years of research, the use of new chemicals, and technical advances stimulated by wars are outlined in the booklet. Published to assist manufacturers and users of steel containers in selecting standard coatings to meet individual needs, it also explains how special and unusual packaging requirements may be satisfied.

"ARE YOU THE MAN WHO HAS THE TEMPERATURE CONTROL PROBLEM?"

COURTESY WHEELCO INSTRUMENTS COMPANY

NEW BOOKS

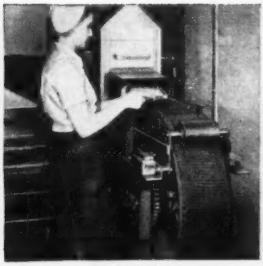
Metallic and Non-Metallic Coatings for Gray Iron. By Charles O. Burgess. Published by the Gray Iron Founders' Society, Inc., 210 National City-E. 6th Bldg., Cleveland 14, Ohio. 76 pages. 45 illustrations. Price, $1.25.

This manual describes practical, workable methods of applying all known types of coatings to gray iron castings. Filled with ideas and instructions, it enables designers to realize substantial product economies and conserve vital alloys without sacrifice in wear, heat, or corrosion resistance. Suggestions include means of improving appearance and obtaining wider consumer acceptance of products.

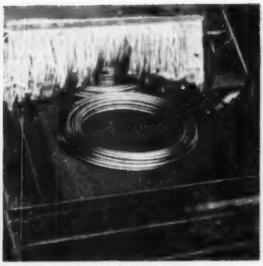
Written in non-technical language, this handy reference manual also contains 45 graphic illustrations of coated castings, a complete bibliography on each coating process, and a representative list of manufacturers experienced in coating application.

Abrasive Grain Sizes (Simplified Practice Recommendation R118-50). Published by the Superintendent of Documents, Government Printing Office, Washington 25, D. C. 5 cents.

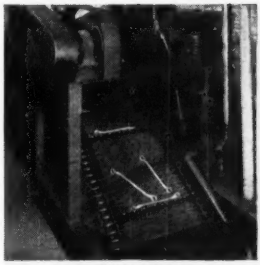
HOW CAN YOU USE *Cambridge* WIRE BELTS TO SPEED PRODUCTION ...REDUCE COSTS?



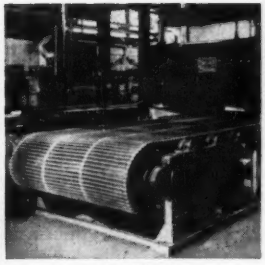
BRAZING



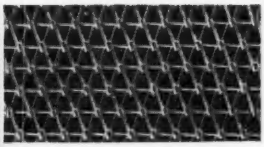
ANNEALING



QUENCHING



TEMPERING



The Cambridge Rod-Reinforced Weave is widely used in the metal working industry. It combines high tensile strength with low thermal capacity and straight belt travel.

These are just a few illustrations of the many applications for Cambridge woven wire conveyor belts in your industry.

In any process that can be combined with movement, and under practically any operating conditions . . . heat, cold or corrosive agents . . . a Cambridge belt can reduce costs by eliminating manual handling, speed production by maintaining a constant flow of parts through processing.

Cambridge belts are available in any metal or alloy and with special attachments such as retaining selvages, cleats and drive mechanisms. They can be woven to close meshes that provide a smooth, non-marking carrying surface or to open meshes to allow free heat circulation or fluid drainage.

Whenever you have a problem concerning movement during processing rely on the experienced advice of your Cambridge field engineer. Write direct or call your nearest Cambridge office. See "Belting, Mechanical" in your classified telephone directory.

FREE CATALOG gives Cambridge belt design, specifications and construction features, also conveyor designs and metallurgical data. Write for your copy today.

The Cambridge Wire Cloth Co.

WIRE CLOTH | METAL CONVEYOR BELTS | SPECIAL METAL FABRICATIONS

Department A
Cambridge 4, Maryland

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

This recommendation covers the allowable limits for the sizing of aluminum oxide and silicon carbide abrasives for polishing uses and for grinding wheels. It became effective for the first time in 1930 and was revised in 1936 and 1944.

Heretofore, the recommendation contained one table of sizes for polishing use and for grinding wheels. The revisions, which were proposed jointly by the Abrasive Grain Association and the Grinding Wheel Institute, provide two tables: one for sizing abrasives for grinding wheels and anotner for sizing abrasives for polishing uses. Appropriate changes are made in the sizing and limits of certain grit numbers to make them suitable for these needs.

Annual Report of the National Bureau of Standards for 1949 (NBS Miscellaneous Publication 198). Published by the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. 101 pages, 27 half-tone illustrations. Price, 75 cents; foreign, $1.00.

This booklet is a summary of scientific investigations carried on at the National Bureau of Standards during the fiscal year 1949. Scientific activities were conducted by 13 divisions concerned with electronics, applied mathematics, atomic and radiation physics, radio propagation, electricity and optics, heat and power, chemistry, mechanics, organic and fibrous materials, metallurgy, mineral products, and building technology. Of the numerous and varied projects carried on by approximately 100 sections within these divisions, those of greatest general interest and widest application have been selected as typical for description.

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Tentative Standard Test for the Determination of Nickel. Published by the Porcelain Enamel Institute, 1010 Vermont Ave., N. W., Washington 5, D. C. Price, 25 cents.

A new, tested method for determining the weight of thin nickel coatings used in preparing metal for porcelain enameling has been announced by the Porcelain Enamel Institute. Because it is expected to make possible more efficient use of nickel coatings, the process should result in conservation of this critical material, the supply of which is being limited for non-defense production.

The results of experiments conducted under the supervision of PEI's Quality Development Committee, the nickel test fills the need for a rapid, non-destructive "weighing" method to help control the actual weight of nickel coatings, which are an important factor in developing a strong enamel-to-metal bond in porcelain enameling applications. A regular plant workman without professional training can administer the test.

American Standard Safety Code for Ventilation and Operation of Open-Surface Tanks, Z9.1-1951. Available from the American Standards Association, 70 E. 45th St., New York 17, N. Y. 24 pages. Illustrated. Price, 75 cents.

To protect workmen from escaping gas, vapor, or mist involved in open-surface tank operations, American Standard Safety Code for Open-Surface Tanks, Z9.-1-1951 has been approved.

Operations involving the immersion of materials in liquids and their subsequent removal are covered in the code. These include electroplating, washing, anodizing, pickling, quenching, dyeing, dipping, tanning, dressing, bleaching, degreasing, alkaline cleaning, stripping, rinsing, and digesting.

The standard classifies open-surface tank operations into twelve classes depending upon the relative need for con-

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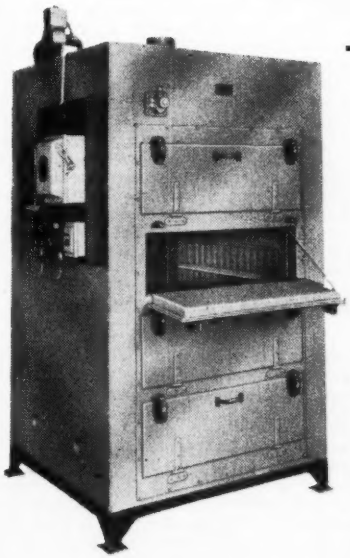

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trolling the gas, vapor or mist rising from the tank. Tables are included to allow classification of any open-tank operation from a knowledge of the tank temperature; the boiling point, flash point and relative evaporation rate of the liquid in the tank; the maximum allowable concentration in the air of the vapor or mist produced; and the extent that the operation produces mist. Ventilation requirements vary with the need for control as indicated by the classification of the operation.

The standard stipulates for each "class" a minimum control velocity for enclosing hoods with one or two open sides; for canopy hoods with three or four open sides; and for lateral exhaust with no hood over the tank. The procedure is also outlined for computing the ventilation rate (in cubic feet of air per minute) required to maintain the necessary control velocity for each hood type and includes a number of examples of these computations.

Rules on personal protection are included as well as rules on operation; inspection; maintenance and installation; special precautions for cyanide; and vapor degreasing tanks. Provision is made to allow the use of both control means other than ventilation, and methods of ventilation involving supplied as well as exhausted air.

The appendix at the back of the code includes tables of the resistance to corrosion of materials used for hoods, ducts, and exhaust fans, as well as seven pages of typical exhaust hood designs.

Paint Testing Instruments. Published by Sawell Publications Ltd., 4 Ludgate Circus, London, E. C. 4, England. 72 pages. Illustrated. Leatherette covers. Price, 7/6 ($1.05).

"Paint Testing Instruments" is based on a series of articles by L. A. Cooper, technical editor of "Product Finishing," a British publication.

With the constant drive to produce finishes of the utmost durability in the most economical manner, the paint user is having to use test instruments to an increasing extent both for process control and for performance tests. For this reason the text is designed to act as a guide to the available British and American instruments, while the theory behind them has either been avoided or reduced to its simplest terms.

Finishing Handbook & Directory (1951). Prepared by W. J. Roberts, L. A. Cooper, and A. G. Bennett, editors of "Product Finishing." Published by Sawell Publications Ltd., 4 Ludgate Circus, London, E. C. 4, England. 245 pages. Illustrated. Leatherette covers. Price, 15/-($2.10.)

In the five chapters, Finishing Handbook and Directory deals with preparatory treatments, painting processes, electroplating and electropolishing processes, light alloy finishing, and wood finishing. Notes, tables, and data of interest and use to the finishing shop are given, including such information as the metallic elements and their properties, pH values for electroplating solutions, gallon capacity of circular tanks of a given depth and diameter, standard gauges, temperature conversion tables, and so on.

The directory section of the book is subdivided into three sections dealing with trade names, products, services and specialties, and brand names.

Indium. By Maria Thompson Ludwick. Published by The Indium Corporation of America, 60 E. 42nd St., New York 17, N. Y. Price, $7.50.

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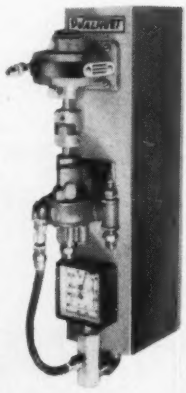

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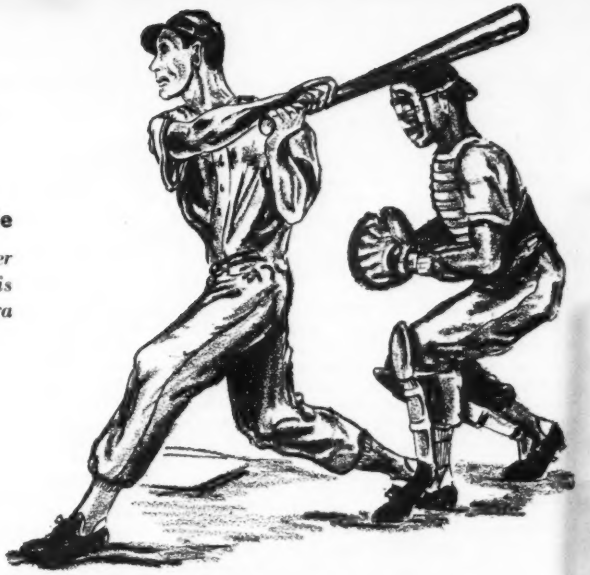
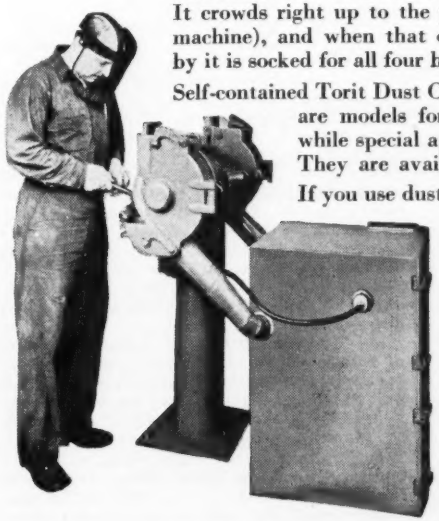


Torit Dust Collectors

are a hit wherever industrial dusts create a problem.



The Torit Dust Collector is one of those compact, solidly built hitters. It crowds right up to the plate (your cut-off, grinding or polishing machine), and when that old apple (dust particle) comes whizzing by it is socked for all four bases.

Self-contained Torit Dust Collectors range in size up to 5 H.P. There are models for every standard dust-creating machine, while special applications can be quickly made to order. They are available in both cabinet and cyclone types.

If you use dust-making machines it will pay to scout the Torit Dust Collector. Just drop us a line, outlining your problems and we'll give you batting averages and all other pertinent data, including catalog covering the complete line.

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able information on indium, beginning with its discovery in 1863 through 1949, are found references to all published material on the subject. The collection of data has been classified, digested, and organized to provide a practical source for information on all of this metal's phases, including analysis, methods of recovery, metallurgical characteristics, chemical compounds, preparation and analytical methods, alloys, and suggested uses.

The material is world-wide in scope, is concisely presented, including phase diagrams of the various alloy systems, tables of physical constants, photomicrographs, and charts. References to the literature on indium are contained in an annotated bibliography of approximately 200 pages.

Determination of Impurities in Electroplating Solutions (A. E. S. Research Report Serial No. 16). By Earl J. Serfass, P. Burkhead, W. S. Levine, P. J. Prang, M. H. Perry, Sanjoy Sen, and R. B. Freeman. Published by the American Electroplaters' Society, P. O. Box 168, Jenkintown, Pa. 54 pages. Illustrated. Price, $1.00.

An addition to A. E. S. Research Reports, Serial Nos. 3 and 6, this book concerns the determination of silver, chloride, lead, chromium, and nickel in copper plating solutions.

"What wise guy's been monkeying with this temperature recorder?"
(Courtesy Wheelco Instruments Co.)

For further information on any product mentioned in this issue—use the READER SERVICE CARDS between the covers.

37th Annual Proceedings of the American Electroplaters' Society. Published by the American Electroplaters' Society, Box 168, Jenkintown, Pa. 296 pages. Illustrated. Cloth binding, board covers. Price, $5.00.

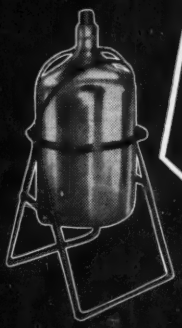
This volume presents a record of the technical sessions of the 37th Annual Convention of the American Electroplaters' Society, held in Boston, Massachusetts, from June 12 to 15, 1950. It provides a record of the Convention proceedings, as well as a complete presentation, with photographs, of each technical paper and the discussion following the presentation. The various committees of the American Electroplaters' Society are listed, as well as the A.E.S. Branches, and other informative data concerning the Society and its functions.

Porosity of Electrodeposited Metals, Parts IV-IX (A.E.S. Research Report, Serial No. 17). By N. Thon, Denis Kelemen, and Ling Yang. Published by the American Electroplaters' Society, P. O. Box 168, Jenkintown, Pa. 36 pages. Illustrated. Price, $1.00.

This booklet discusses such subjects as the measurement of very low porosities by the low pressure-constant overpressure method; measurement of the corrodibility of metal foils, effect of surface structure of the base metal on the permeability and corrodibility of deposits; rates of corrosion of protectively plated iron foils; loss of weight, increase of permeability, and failure of electrodeposited coatings; and the effect of certain aromatic polysulfonates on the permeability and corrodibility of electrodeposited nickel foils.

In addition, there is included a reprint of a talk by W. A. Wesley, assistant director of the Research Laboratory of The International Nickel Company, Inc., entitled "Why Pay for Porosity Research?"

The Aluminum Data Book. Published by Reynolds Metals Co., 2500 S. 3rd St., Louisville 1, Ky. 194 pages, 6 x 9 inches. 61 illustrations. 117 tables. Wire binding.



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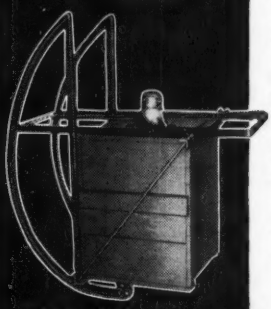

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A revision and enlargement of a similar book issued by Reynolds in 1948, this handy pocket-size manual, which is available without charge to engineers, designers, and technical men requesting it on their company letterheads, contains 32 more pages with considerable additional data covering new alloys. Essential facts for use in the selection of aluminum alloys and mill products have been condensed into tables of data on physical, chemical, and mechanical properties; standard tolerances; weights; standard sizes and production limits; as well as much fabricating data. Included are tables showing relative corrosion resistance, the action of many chemicals on aluminum, elevated and low-temperature properties, fatigue strengths, minimum bend radii, joining methods, finishes for aluminum, and considerable other information.

In addition, there are 33 pages of explanatory text covering a wide range of related subjects such as the alloy designation system, temper designation system, heat-treatable and non-heat-treatable alloys, casting alloys, casting methods, and foundry practice. Wrought aluminum mill products are detailed and manufacturing methods described. Another section covers pig and ingot products, while separate sections on physical properties, chemical properties, and mechanical properties define terms used and special characteristics of aluminum.

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This machine can do a great job for a concern producing shells, rockets or similar defense material.

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615 State St. Toledo 2, Ohio

Heat-Resistant Finish. "Sicon," an improved silicone base heat-resistant finish for metal products requiring a highly heat-resistant protective coating which is applicable by brush, dip, or spray, is the subject of a four-page, colorful folder released by Midland Industrial Finishes Co., Waukegan, Ill. Characteristics and features of the finish, together with actual case histories, are included.

Tumb-L-Matic Dry Process. Tumb-L-Matic, Inc., New York 70, N. Y., has released a bulletin describing the latest methods for cutting down, deburring, definning, dry burnishing, and polishing metal and plastic parts. **Bulletin No. LS-50** describes the complete line of Type LS (single tumbler) equipment, and drives, sizes, controls, and liners. Tumb-L-Matic's specific process is discussed.

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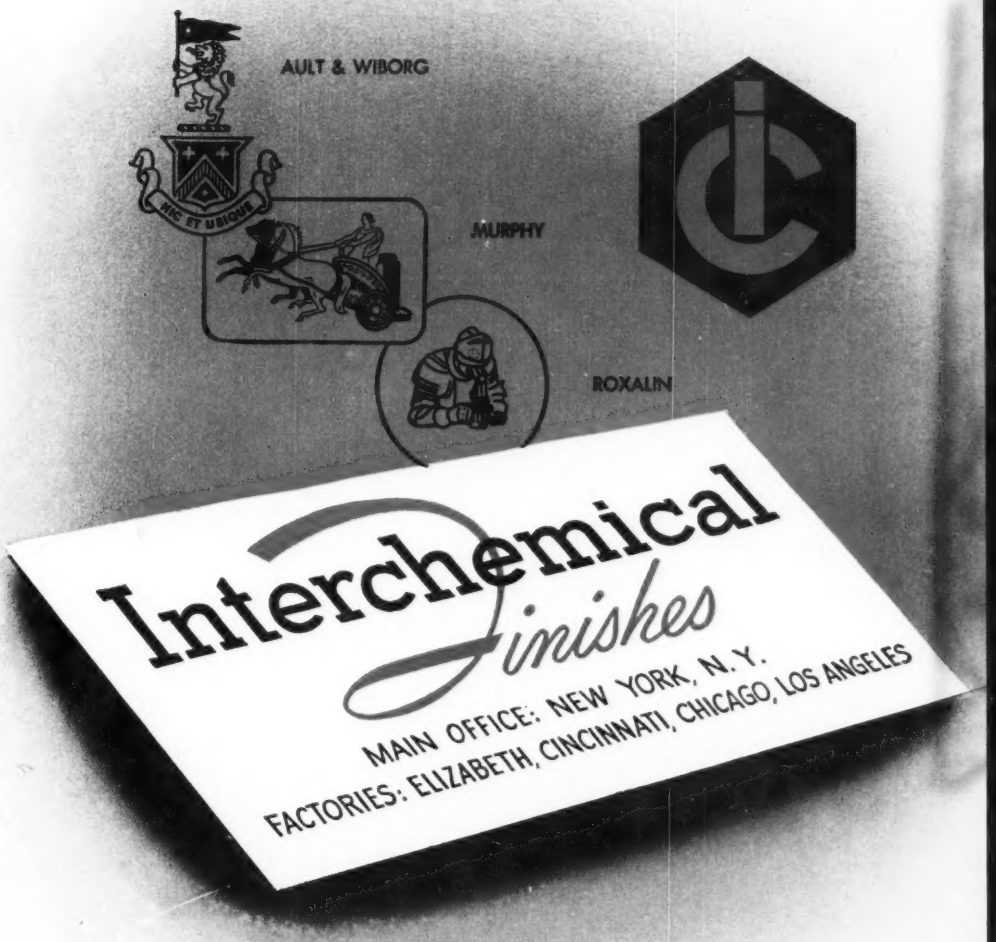

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